# Elevator SJT—WVF5 Control System Commissioning and Maintenance Instruction

Elevator Control System User Guide

Data  Number:  SWVF5-30.1-0807

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# Chapter 1 Introduction to the Functions of BL3000 Serial Control System

## 1.1 List of basic functions

| No. | Description | Usage | Instruction to elevator action | Remarks |
|---|---|---|---|---|
| 1 | Automatic running | | (1) Automatic door opening upon arrival;<br>(2) Automatic door closing;<br>(3) Manual door closing (door opens when the delay close time is not reached)；<br>(4) Car call registration (anti-nuisance, eliminating mistake operation);<br>(5) Automatic orientation upon call;<br>(6) Automatic stop upon call for the same direction<br>(7) Automatic running to the top storey or ground floor upon call, with other calls waiting | （1）Turn the normal/inspection switch of cabinet to the normal position;<br>（2）Turn the automatic/attendant switch to the automatic position ;<br>（3）The other two normal/inspection switches are on the normal positions. |
| 2 | Attendant running | | (1) Automatic door opening upon arrival;<br>(2) Manual door closing;<br>(3) Car call registration (anti-mischief, cancel of wrong operation);<br>(4) Automatic stop upon call for the same direction. | (1) Turn the normal/inspection switch of cabinet to the normal position;<br>(2) Turn the automatic/attendant switch to the attendant position ;<br>(3) The other two normal/inspection switches are on the normal positions. |
| 3 | Inspection running | Used in debugging, maintenance and inspection | After the system is set to be in maintenance state, if the slow running up or slow running down, the elevator will run upward and downward with the maintenance speed and it will stop when the button is released. Inching open and close. | Normal/inspection switch is respectively positioned on the car top, in the car or on the control cabinet. The preference is from the top to the bottom. |
| 4 | Automatically open door after power on | Automatic door opening | In normal condition, when the system is powered on, if the car is in the landing, the door will open automatically. | |
| 5 | Automatically close door | Delayed automatic door opening | In the condition of automatic running, after the door is opened, the state will be kept and the door will be closed automatically after delay time. | （1）Set the delay time by the door opening holding time parameter (T);<br>（2）For stop upon car call, T-2 seconds will be delayed; |

| | | | | （3）When elevator stops for both car call and landing call, delay time is **T+2 seconds.** |
|---|---|---|---|---|
| 6 | Open door for current floor landing call | Open door upon landing call | In the condition of automatic running, when door is being closing or already closed but elevator doesn't start, door will be opened automatically again. | The set open door holding time is still effective for delay door closing. |
| 7 | Safe board or photoelectric board protection | Set against nipping passenger | If safety door edges is touched or photoelectric board is sheltered, door close action stops at once and door will be opened automatically. | After safe board or photoelectric board action is sheltered, door will close again. |
| 8 | Not closing door upon overload | To prevent from overload running | If elevator is overloaded, door is opened, overload light is turned on, buzzer sounds, 'CZ' is displayed on COP and the elevator can not start. | It restores normally after overload is cleared up. |
| 9 | Passby upon fullload | To increase running efficiency | Elevator responds to car call and not to landing call when it is in full load. | It restores normally after fullload is clear up. |
| 10 | Passby under attendant control. | VIP running | In attendant state, elevator responds to car call if non-stop button is pushed down, the elevator will only respond to car call instead of landing call. | |
| 11 | Running state display | Maintenance and debugging | Elevator running state, direction, floor, door state, load and fault information may be displayed on LCD on the main board in cabinet. | |
| 12 | Automatically control light | Energy saving | Car light is turned off after 15 minutes (adjustable) if the elevator isn't being used. It will be turned on after receiving any call. | |
| 13 | Fireman service | | When fireman's switch is connected, system enters into fire fighting state: (1) It clears up all calls; (2) It will return to fire floor automatically. (3) Hold-open door; (4) When it arrives at fire floor, it outputs fire signal, hold-open door; (5) If elevator direction is opposite, it stops at nearest floor without open door and returns to fire floor and holds the door open. | There are two kinds of fire mode for user to choose: (1) Mode 1: elevator returns to fire floor and stops service. (2) Mode 0: (a) Landing call is invalid. (b) Door is open at fire floor. (c) When elevator is need to start service, fireman pushes down car call button and presses close door button until door closed. If close door button is released before door is completely closed, door will be opened again. (d) If door keeps close after elevator |

| | | | | |
|---|---|---|---|---|
| | | | | arrives at destination floor, firemen should press open door button until door is opened. If open door button is released before door is completely opened, door will be closed again.<br>(e) Only one destination floor can be set every running. |
| **14** | Automatically stop for fault | Saving passengers | If elevator stops at non-landing for fault in the condition of high-speed running, car will creep to landing in the direction to middle floor and then door will be opened. | Only when safe circuit and inverter are both normal. |
| **15** | Parking | In parking state | When electronic lock is closed, elevator enters into landing state:<br>1.　Elevator doesn't respond to landing call. If there is car call, it finishes all car call service and returns to parking floor (set).<br>2.　If there is no car call, it returns to parking floor directly.<br>3.　After it arrives at parking floor:<br>(1) Landing call box and COP display 'ZT'.<br>(2)　The elevator can not respond to any call.<br>(3) Door is automatically closed, light is turned off and the display is extinguished after 10 seconds.<br>(4) Pressing any car call button or close/open door button, light is turned on.<br>(5) Pressing close/open door button; Door will be automatically closed and light will be turned off again after 10s. | (1) If the elevator is in inspection state when electronic lock is closed, elevator can't return to parking floor, the other functions are the same.<br>(2) CPU is always in parking state when elevator keeps in parking state and as soon as electronic lock is opened, the elevator will not be in the parking state. |

| No. | Description | Usage | Instruction of elevator action | Remarks |
|-----|-------------|-------|-------------------------------|---------|
| 16 | Parallel control | To increase running efficiency | (1) When there is landing call, two elevators respond to it at one time. One of them finishes the service by the rule of speediness and economy from their position and direction, therefore, elevator efficiency is improved.<br>(2) When two elevators both haven't service, one returns to homing floor (usually the 1st floor), and another one stands by. | When parallel connection of two elevators is connected by supplied cables and parallel connection parameters are set correctly, parallel running can be realized. |
| 17 | Group control running | Multi-elevator optimized control | BL3000 can control 8 elevators simultaneously | |

## 1.2. Special functions

| No. | Description | Usage | Instruction of elevator action | Remarks |
|-----|-------------|-------|-------------------------------|---------|
| 1 | Hoistway self-learning | Measure and save the hoistway data | In maintenance state, from the lower limit switch to the upper limit switch, the control system can get and save the date on the position of landing and hoistway switch forever. | In the self-learning, if abnormal condition occurs, the learning will stop and error signal will be output. For the error list, please see the appendix 3;<br>▲Note: When the self-learning is stopped, only if the word "Success" displays on the LED, the self-learning can be thought to be completed. |
| 2 | Cancel mistake operating | Cancel car call | Pressing the car call button again, it can be canceled (the light for car call turns off). | It can be achieved when the elevator is not running. |
| 3 | Anti-mischief | Anti-mischief | 1.　When elevator arrives at farthest floor and changes direction, it clears all car call registers.<br>2.　If it has load detection device, when it is unerload, the number of car call is 3 at most. | |

| | | | | |
|---|---|---|---|---|
| **4** | Landing call button inset diagnose | Fault indication | When landing call button is pressing for over 20s, this button is thought to be inserted (can not be reset) and the landing can not be registered. The corresponding light twinkles to alarm. | When the button is released, the system restore normally. |
| **5** | Repeat close door | | In the condition of auto running, after performing the close door command, if door inter-lock circuit doesn't put through, elevator opens door and closes it again. | If the action repeats 5 times, door inter-lock circuit still doesn't put through, system stops service and display fault code. |
| **6** | Floor selection by machine room | Debugging | Complete the car call register by operating the buttons on the LED in the cabinet. | |
| **7** | Machine room door open/close | Debugging | Input the open/close door commends by operating the buttons on the LED in the cabinet. | |
| **8** | Non-stop floor set | Set the floor not to stop at | The elevator does not stop at the set floor. | |
| **9** | Homing floor set | Set homing floor | In automation state, if there is no car call or landing call in a certain time, elevator returns to homing floor automatically. | Homing floor can only set to one floor. |
| **10** | Random setting of the floor displaying character | To meet floor displaying requirements | Floor displaying character may be set by the buttons on LCD in the cabinet, which can be letter or figure. | |
| **11** | Attendant selecting direction | VIP running | In attendant state, attendant has preference to choose running direction by up/down button. | In attendant state |
| **12** | Timing automatic start/stop service | Automatically start/stop service | The system can execute the start/stop (homing) service time by practical setting time. | 1    Time is set by 24 hours. 2    The function can be canceled if both the start and stop times are set to be 00. 3.    Electric lock preference: This function is valid when electronic lock is switched on, if it is switched off, elevator works at parking state. 4.    If you want elevator to exit from automatic stop service, you may perform the following operation: (1) Switch electronic lock |

| | | | | from on to off for 1s, then switch it on again, the system will enter the enforced running state and the elevator can run normally.<br><br>(2) After that, switch electronic lock from on to off for 1s, then switch it on again, the system will exit the enforced running state and elevator will enter into automatically stop service state. |
|---|---|---|---|---|
| **13** | Special running | Services for special passenger | The landing call is invalid in this state. The elevator is controlled by the attendant. Door control mode is the same as attendant mode. | When special switch is equipped |
| **14** | Close door delay | Prolong the open door holding time | In automation state, during the door opening to the automatic door closing, if the button is pressed, the holding time of the opening will be prolonged to be the set prolonging time. | （1）The elevator is equipped with corresponding button.<br>（2）It is usually used in hospital elevator. |
| **15** | Rear opening control | Elevator with 2 doors | It can control the opening and closing of two doors act at corresponding floor. | For the definition and setup of the rear opening, please refer to the rear opening action selection and rear opening form selection respectively in the basic parameters and special parameters of this manual. |
| **16** | Fault diagnosis | Automatically searching and recording the error information | (1) When elevator is error, the system diagnoses the fault and display fault information on LED.<br>(2) The time, type and floor of the latest 20 faults will be stored in fault report for maintenance personnel to check. | For the error codes, please refer to relative appendix 3. |
| **17** | Interference evaluation | Automatically detect the site interference | It can evaluate the ground connecting condition (restraining interference source) of the control cabinet and the ground connection of hoistway (reliable shied); in addition, It conducts maintenance personnel to remove hidden trouble and provides more safe and reliable circumstance. | This function is used after finishing debugging. |

| 18 | Encoder evaluation | Automatically inspect the quality of the encoder output pulse | It analyzes and evaluates the encoder pulse signal to avoid the error caused by the encoder and conducts maintenance personnel to remove the trouble on tingling and leveling. | The judgment of the quality of encoder and the interference condition. |
|---|---|---|---|---|
| 19 | Evaluation of the interference on input port | Automatically detect the quality of input signal | The system can evaluate the input signal and displays it by on LCD; in addition, it can conduct the personnel to reasonably and properly complete the wiring and ground connection, so as to eliminate the interferences of the trailing cable and hoistway parallel connected with the main board to the input of the main board. | The direct display of electric level interference of the input circuit |
| 20 | Automatic rescue running | When power off, the automatic rescue device will supply the power for leveling | After power off, the automatic rescue device (ARD) will supply the power for the leveling of the elevator and the escaping of the passenger: The automatic rescue running should meet the following requirements: 1. When power off, the automatic rescue device will supply the power (the automatic rescue running input X18 of the main board is valid); 2. The elevator is not in maintenance state; 3. The elevator is not in landing; 4. There is no running fault; 5. The door lock circuit signal is normal; The running process of the automatic rescue : 1. Determining the running direction according to the load condition; 2. The elevator runs to the possible nearest floor and keeps the open state; after a certain time, the ARD cut off the power supply; 3. The power supply of the elevator restores; the elevator returns to the bottom floor to correct the calibration. When the elevator is in the landing, the ARD supplies the power (the automatic rescue running input X18 of the main board is valid) and the door opens automatically. | Because the ARD is used in the automatic rescue running, and the drawing of control cabinet in the system is different from the standard drawing, so please contact our technical office for the reference drawing; if the SYT-YY automatic rescue device manufactured by our company is used, please see the appendix 4: specification of the SYT-YY automatic rescue device. |

| 21 | The functions of the elevator for the disabled | For the convenience of the disabled to use the elevator | 1. The working principle: when leveling, if there is the car call or landing call of the disabled, the open holding time will be prolonged (the open delay time can be set); if the open button on the operating panel of the disabled is pressed, the open holding time will be prolonged (the open delay time can be set). | 1. Enable the functions by setting parameters; <br> 2. Operating panel for the disabled: the car call instruction and the open/close input buttons; <br> 3. Landing call board: by the board, the landing call of the disabled and the normal landing call can be distinguished; <br> Setting of landing call board address <br> ◆ When the main board use the functions for the disabled (function choice FU14=ON), the setting of the landing call board should follow the following: <br> ◇ **1～32** is the absolute floor address corresponding to the general landing call: 1 is the ground floor, 2 is the second floor and the total 32 floors can be set at most; <br> ◇ **33～64** are the absolute floor addresses of the landing call for the disabled: 33 is the bottom floor, 34 is the second bottom floor, and total 32 floors can be set with the top floor is the floor 64; <br> ◇ If only one landing call can be used for one floor, the corresponding address of another landing call will be vacant. <br> ◆ The connections of the car call buttons: <br> ◇ When the functions for the disabled are used by the main board, the connections of the car call buttons for the **1～N** floor are normally connected to the car call ports of the **1～N** floor in the car as the normal car calls(n is the total floor number); **N+1~N+N** can be |
| --- | --- | --- | --- | --- |

| | | | taken as the car call of **1～N** floor on the operating panel for the disabled.<br>◇ The opening 2 and closing 2 inputs on the operating panel can be input as the opening/closing input for the disabled.<br>(Note: the functions for the disabled can not be used with the rear opening) |
|---|---|---|---|
| **22** | Earthquake running function | | Stop at the nearest floor after earthquake signal is input and release passengers | |
| **23** | Wireless telemonitoring function | Monitoring | Equipped with wireless telemonitoring device, achieving online monitoring over the elevator | Fit wireless telemonitoring device |
| **24** | Pre-opening function | Idling running and pre-opening when in low speed running, to increase the efficiency | After the elevator normally reduces the speed and runs to the target landing, if the following conditions are met, the elevator will pre-open the door:<br>1. The elevator normally runs to the target landing after speed change;<br>2. The two pre-opening sensor are effective;<br>3. The speed is lower than the pre-opening speed (when in pre-opening, the running speed should be lower than the setting value of the pre-opening protection speed);<br>4. The low speed output of the inverter is valid;<br>5. Safety circuit board outputs are valid; | In the functions of the special parameters, if the parameter FU20=ON is selected, the pre-opening function will be valid; for pre-opening /re-leveling wiring diagram and instruction, please see appendix 5. |
| **25** | Re-leveling function | To get the re-leveling accessed | When the elevator stops at the current floor and when excessive passengers enters or exits the elevator, because of the extension or shortening, the car separate from the leveling zone (one of the landing sensor is separated); the elevator will run to the leveling point with low speed and door opening.<br>The conditions of re-leveling:<br>1. Leaving the leveling area | In the functions of the special parameters, if the parameter FU19=ON is selected, the pre-opening function will be valid; pre-opening /re-leveling wiring diagram and instruction, please see appendix 5. |

| | | | when the elevator stops. |
| | | | 2. The two pre-opening sensor are valid; |
| | | | 3. The speed should be lower than the re-leveling protection speed; |
| | | | 4. The low speed output of the inverter is valid; |
| | | | 5. Safety circuit board outputs are valid; |

## 1.3. List of safety protection functions

| No. | Description | Action instruction |
|-----|-------------|--------------------|
| 1 | Safety circuit protection | If safety circuit is opened, the elevator stops at once. |
| 2 | Door inter-lock protection | Only all door interlocks are closed, elevator can run. If door interlock is opened or tingled, elevator will stop. |
| 3 | Running contactor protection | System may check the reliability of action of the motor main circuit contactor, if there is abnormality (e.g. not picking up or conglutination), the elevator will stop. |
| 4 | Brake inspection protection | The opening and closing of the brake can be real-time inspected by the brake arm inspection switch; if brake action is error, system will forbid the starting of the elevator. |
| 5 | Terminal landing speed change and floor number correct | When the system detects the terminal switch during running, elevator is forced to change speed and correct the display of floor number. |
| 6 | Limit protection | When system detects limit switch, elevator will stop at once. |
| 7 | Final limit protection | When system detects the actions of final limit switch, system will be powered off. |

## 1.4. List of selectable functions

| No. | Description | Instruction |
|-----|-------------|-------------|
| 1 | Telemonitoring | The running of the elevator can be real-time monitored in monitor center by wire or wireless communication module. |
| 2 | Arrival gong | Arrival gong indication |
| 3 | Voice synthesizer | Voice indication |
| 4 | ID identify | ID/IC card controlling |
| 5 | Weighting apparatus | The system can be equipped with weighting apparatus. |

**This system can be equipped with synchronous or asynchronous machine as well as gearless and gear traction machine.**

# Chapter 2 Types of BL3000 Serial Control System Computer Boards

## 2.1. Designation of product models

### 1. Basic regulation

**BL3000**—□□□—**V**□
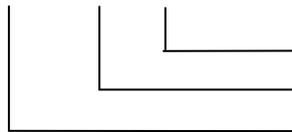
VERSION No.: product version upgrade, represented by: V + number ".

FUNCTION No.: usages and main technical features of products, represented by the abbreviation of initial alphabet.

SERIAL No.

### 2. Designation of main board, car board and car expansion board

BL3000 serial control system is well compatible with BL2000 serial control system, with periphery control boards (such as operating panel, call board) still using BL2000 series of products.

（2）Main board :             BL3000-STB-Vn
（3）Car board               BL2000-CZB-Vn
（4）Car expansion board     BL2000-CEB-Vn
（5）Group control board     BL2000-QKB-Vn
（6）For other types, please refer to table of computer board types of 2.2.

### 3. Designation of elevator landing call and display boards

（1）Code of features:       The first H represents landing call and display board

The second A: point array vertical display, B: point array horizontal display, C: 7 segment vertical display, D: 7 segment horizontal display.

The third H: high light, S: over light and R: over high light

（2）Version code:          The first code represents luminescent diode parameters of digital displaying block.

A: 1357
B: 1057
C: 1257
D: 1067
E: 2058
F: BS252
G: BS402

The second code means version upgrade, represented by numbers.

（3）For the object, please refer to Diagram 3-3-4-1.

## 2.2. Table of BL3000 serial control system computer boards

| Name | Model | Unit | Instruction |
|---|---|---|---|
| Main board | BL3000-STB-V2 | block | |
| Car board | BL2000-CZB-V7 | block | Contains command for 8 floors. |
| Car expansion board | BL2000-CEB-V2 | block | Command for 8 layers is added when one block is added. |
| Landing call and display board | BL2000-Hxx-xn | block | Details please refer to Diagram 3-3-4-1. |
| Landing call and display interface board | BL2000-HXJ-V2 | block | |
| Group control board | BL2000-QKB-V2 | block | Group control of 8 elevators |
| Group control landing call and display board | BL2000-HQK-V2 | block | For group control |
| Arrival gong | SJT-DZA | one | |
| Load inspection device | SJT-150 | one | For car with car bottom |
| Voice synthesizer | SJT–YBA–V6 | one | |
| Remote control device | SJT-WJ | one | Remote control center end |
| Remote control device | SJT-WK | one | Control cabinet end |
| IC card wired data collector | SJT-QIC-V2 | one | Remote control center |
| IC card wired remote monitor | BL2000-KIC-V2 | one | Control cabinet end |
| ID cared wired data collector | SJT–QID–V2 | one | Control center |
| ID card wired remote monitor | BL2000-KID-V2 | one | Control cabinet end |
| Car IC card floor selector | BL2000-CIC-V2 | one | |
| Car ID card floor selector | BL2000-CID-V2 | one | |
| IC card reader | MF-500 | one | |
| ID card reader | YX-K4-232 | one | |

Note: The table is only for reference because the contents may be changed with time.

# Chapter 3 Combination and Components of Bl3000 Serial Control System

## 3.1. Schematic diagram of system composition

Control cabinet

TB1

Power

M1   PG

Signal from machine room

Remote control

Inverter

Micro-control unit

GC-1  GC-2  GC-3   GC-4      GC-7

CB5

CB2

CB3

Hoistway switch

CNT car top branch box

CB9

Car board
BL2000-CZB

Car extend board
BL2000-CEB

Car extend board
BL2000-CEB

Call and display board
BL2000-Hxx

Calling unit

Call and display board
BL2000-Hxx

Diagram 3-1: Schematic diagram of BL-3000 serial control System composition

## 3.2. Performance of the main parts of the system

The **main parts of the system** related in the manual means the boards composing of **BL3000** serial control system, which consists of: main board, car board, car expansion board, landing call and display board, group control board, group control landing call and display board, voice synthesizer and load inspection device. The serial products of control cabinet with **BL3000** serial control system and the other components in **BL3000** serial control system are not contained.

### 3.2.1 Description of features:

3.2.1.1.    32bit Fujitsu industrial control single chip computer, double CPUs;

3.2.1.2.    Four-layer plate binding process with CAN bus serial communications;

3.2.1.3.    High intelligence, strong resistance to interference, and high reliability;

3.2.1.4.    Keyboard operation and liquid crystal display;

3.2.1.5.    Specialty of elevator operating curve and the leveling precision $\leq$ 3mm when landing directly;

3.2.1.6.    Support parallel connection, group control, monitoring and intelligent management;

3.2.1.7    Provided with RS-485 communication interface (which can be connected with weight inspecting device made by Blue Light to improve elevator startup)；

3.2.1.8    Use portable computer to connect with RS232 interface, being able to choose velocity of elevator in car to comfort passenger.

### 3.2.2. Scope of application:

3.2.2.1.    Elevator selective-collective operation, two elevators parallel connection and group control of 3-8 elevators;

3.2.2.2.    Range of speed: 0.5-4m/s;

3.2.2.3.    Applicable storey: below 64 floors.

3.2.2.4.    Passenger elevator, freight elevator, ward elevator and residential elevator；

3.2.2.5.    With weighting inspecting compensation and fire control linked interface;

3.2.2.6.    Support wired video monitoring, remote monitoring and wireless remote monitor；

3.2.2.7.    Applicable to gear towing machine and gearless permanent magnetic towing machine.

### 3.2.3. Standards for reference

3.2.3.1.    Elevator Manufacture and Installation Regulation (GB7588-2003)

3.2.3.2.     SJT Serial BL3000 Elevator Control System (Q1SL.J02.01-2003)

### 3.2.4. Power supply specification

Voltage: DC24V $\pm$1.2V；current: 2A；

Voltage : DC5V    $\pm$0.1V；current: 1 A.

▲Note: Increase the power capacity when the building is more than 20 storeys. For each storey, the increasing value should be $\geqq$100mA.

### 3.2.5. Working temperature

Working temperature of devices: $-40\,°C \sim +80\,°C$ (except LCD)

### 3.2.6. Inspection standards

3.2.6.1 Inspecting according to GB/T17626.2-1998 Electromagnetic Compatibility- Testing and Measuring Techniques-Static discharging interference test to make sure the requirements are met

(contact discharging: 8kV, test grade: 4).

3.2.6.2 Inspecting according to GB/T17626.3-1998 Electromagnetic Compatibility- Testing and Measuring Techniques-Radiated, radio-frequency, electromagnetic field immunity test to ensure the requirements are met (frequency domain: 80~1000MHz, filed density: 10V/m, signal: 1kHz sine wave, modulation percentage: 80%, test grade: 3).

3.3.6.3 Inspecting according to GB/T17626.4-1998 Electromagnetic Compatibility- Testing and Measuring Techniques-Electrical fast transient/burst immunity test to ensure the requirements are met (power and grounding port-test voltage: 4kV, repetition rate: 2.5kHz) (I/O signal, data, control port-test voltage: 2kV, repetition rate: 5kHz, test grade: 4)

3.2.6.4 Inspecting according to GB/T17626.8-1998 Electromagnetic Compatibility-Testing and Measuring Techniques-Power frequency magnetic field immunity test to ensure the requirements are met (field density: 10V/m, test grade: 3).

## 3.3. Introduction of system main parts with classification

### 3.3.1. Main board BL3000-STB
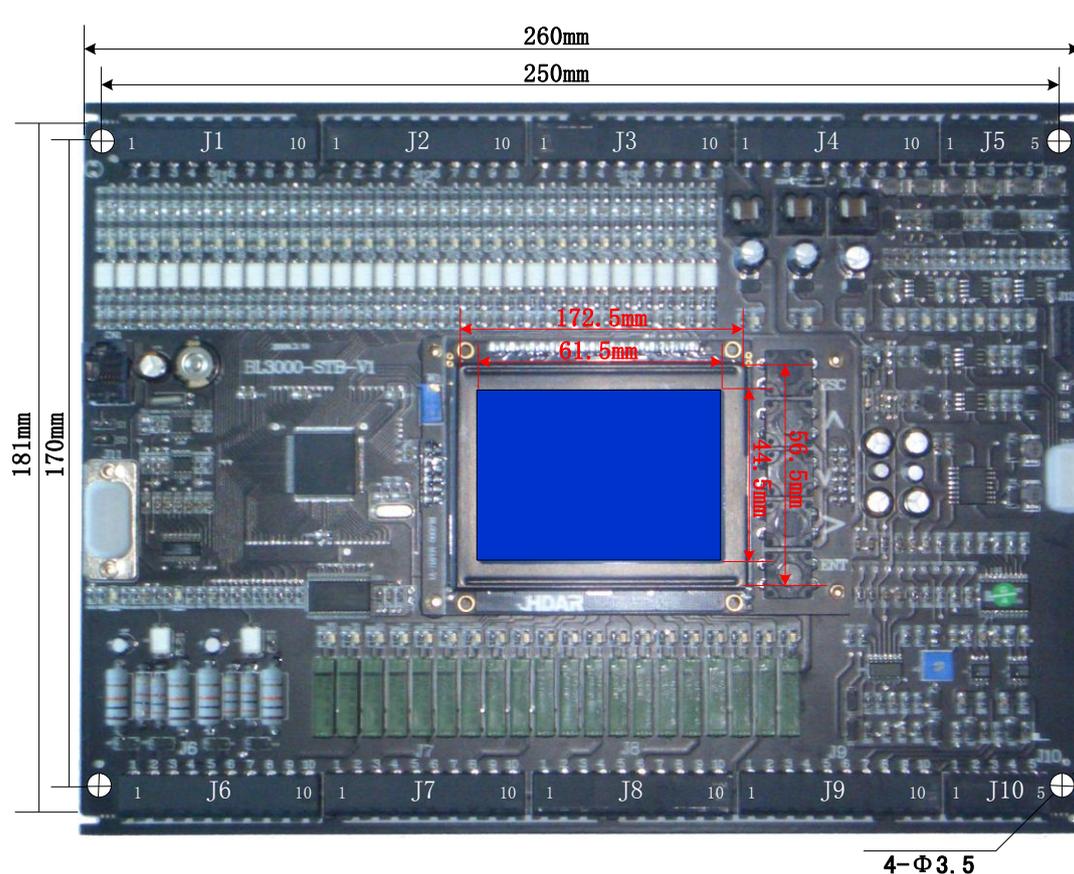


**Diagram 3-3-1-1 Appearance and layout installation dimension of main board BL3000-STB**

1．**Plug specifications**

（1）J1~J10 multi-wire dip socket, model: 5EHDRC (terminal), 5ESDV (end), rated voltage: 300V, rated current: 15A, voltage resistance: 4KV, pitch: 5mm

（2）J11 DB9 pin

（3）J12 double-row connector 2.54/10P

（**4**）J13 single-row pin 2.54/5P

（**5**）CN1 RJ45/RJ11 Jack 6P

## 2．Port circuit

Please refer to:

**Diagram 3-3-1-2**

**Diagram 3-3-1-3**



Push-pull output of frequency division card of coder or inverter

Push-pull output of frequency division
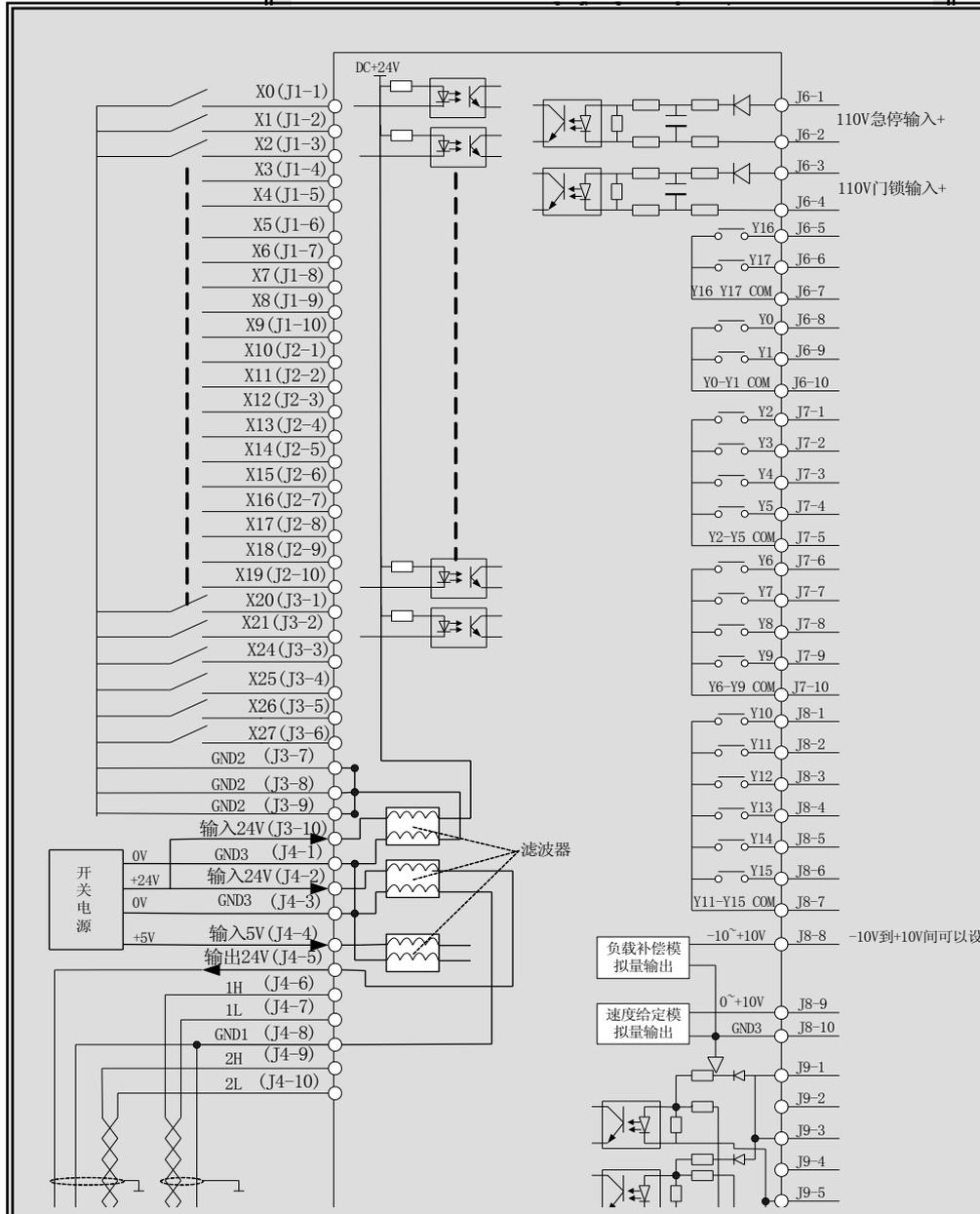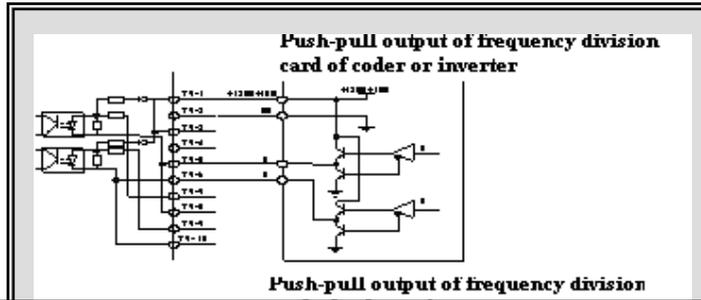
| 急停输入+ | Emergency stop input |
|---|---|
| 门锁输入+ | Door lock input |
| 滤波器 | Filter |
| 输入 | Input |
| 输出 | Output |
| -10v 到 +10v 间可以设定 | Able to set between -10v and +10v |
| 开关电源 | Switching power supply |
| 负载补偿模拟量输出 | Load offset analog quantity output |
| 速度给定模拟量输出 | Analog speed given quantity output |
| 呼梯、操纵盘电源及通讯 | Power supply and communication of call board and operating panel |
| 并联通讯 | Parallel communication |

### 3．Definition and specification of ports

**Table 3-3-1 Definition and specification of main board BL3000-STB port**

| Name | Port No. | Location | Definition | Usage | Technical specifications of ports | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Port form | | | |
| **J1** | X0 | J1-1 | Inspection input | Input | Optical coupler | DC24V 7mA | 10mS | 100Hz |
| | X1 | J1-2 | Up running input | | | | | |
| | X2 | J1-3 | Down running input | | | | | |
| | X3 | J1-4 | Top terminal 2 input | | | | | |
| | X4 | J1-5 | Bottom terminal 2 input | | | | | |
| | X5 | J1-6 | Top limit input | | | | | |
| | X6 | J1-7 | Bottom limit input | | | | | |
| | X7 | J1-8 | Top terminal 1 input | | | | | |
| | X8 | J1-9 | Bottom terminal 1 input | | | | | |
| | X9 | J1-10 | Up leveling input | | | | | |
| **J2** | X10 | J2-1 | Bottom leveling input | Input | Optical coupler | DC24V 7mA | 10mS | 100Hz |
| | X11 | J2-2 | Transducer failure input | | | | | |
| | X12 | J2-3 | Fire input | | | | | |
| | X13 | J2-4 | Emergency stop input | | | | | |
| | X14 | J2-5 | *Door interlock input | | | | | |
| | X15 | J2-6 | *Braking feedback input/main power contactor input | | | | | |
| | X16 | J2-7 | Running contactor input | | | | | |
| | X17 | J2-8 | Braking contactor feedback input | | | | | |
| | X18 | J2-9 | Automatic rescue running input | | | | | |
| | X19 | J2-10 | Transducer running input | | | | | |
| **J3** | X20 | J3-1 | Electronic lock input | Input | Optical coupler | DC24V 7mA | 10mS | 100Hz |
| | X21 | J3-2 | Thermal switch input | | | | | |
| | X24 | J3-3 | Re-leveling input | | | DC24V 7mA | 10 mS | 100Hz |
| | X25 | J3-4 | Re-leveling sensor signal input | | | | | |
| | X26 | J3-5 | Multi-function input | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | X27 | J3-6 | Multi-function input | | | | |
| | GND2 | J3-7 | | | | | |
| | GND2 | J3-8 | 24v ground | 0V | | | |
| | GND2 | J3-9 | | | | | |
| | 24V2 | J3-10 | 24v x0～x21common | | Power supply | DC24V1 47mA | |
| **J4** | GND3 | J4-1 | 0v | Power and communication port | | | |
| | 24VIN | J4-2 | 24v input | | Power supply | DC24V1 0A | |
| | GND3 | J4-3 | 0v | | | | |
| | 5VIN | J4-4 | 5v input | | Power supply | DC5V50 0mA | |
| | 24VOUT | J4-5 | 24v output | | Power supply | DC24V1 0A | |
| | 1H | J4-6 | Parallel /group communication wire txa+ | | CAN | 80mA | 25kH |
| | 1L | J4-7 | Parallel /group communication wire txa- | | | | |
| | GND1 | J4-8 | 0v | | | | |
| | 2H | J4-9 | Landing call /car communication wire txa+ | | CAN | 80mA | 25kH |
| | 2L | J4-10 | Landing call /car communication wire txa- | | | | |
| **J5** | 3H | J5-1 | Standby communication + | | CAN | 80mA | 25kH |
| | 3L | J5-2 | Standby communication- | | | | |
| | X28 | J5-3 | Multi-function input | input | Optical coupler | DC24V 7mA | 10mS | 100Hz |
| | X29 | J5-4 | Multi-function input | | | | |
| | X30 | J5-5 | Multi-function input | | | | |
| **J6** | X22+ | J6-1 | Emergency stop input+ | input | Optical coupler | AC110V 8mA | |
| | X22- | J6-2 | Emergency stop input- | | | | |
| | X23+ | J6-3 | Door interlock input+ | | | | |
| | X23- | J6-4 | Door interlock input- | | | | |
| | Y16 | J6-5 | Deceleration time, switching time | output | Relay | DC5A 24V AC5A 250V | 5/10mS | 20cpm |
| | Y17 | J6-6 | Multi-function output | | | | |
| | COM0 | J6-7 | Y16 Y17 common | output | Relay | DC5A24V AC5A250V | 5/10mS | 20cpm |
| | Y0 | J6-8 | Re-leveling control output | | | | |
| | Y1 | J6-9 | Fire output | | | | |
| | COM1 | J6-10 | Y0～Y1common | | | | |

X15 input: when braking feedback inspection enable is set on "Yes", X15is defined to be brake feedback input; when it is set on "NO", X15 is defined to be main power contactor input.

| Name | Port No. | Location | Definition | Usage | Technical specifications of ports | | | |
|------|----------|----------|------------|-------|-----------|-------------|--------------|-----------|
| | | | | | Port form | Rated load | Off/on time | Max. speed |
| **J7** | Y2 | J7-1 | Open door 2 control output | Output | Relay | DC5A24V AC5A250V | 5/10mS | 20cpm |
| | Y3 | J7-2 | Close door 2 control output | | | | | |
| | Y4 | J7-3 | Open door 1control output | | | | | |
| | Y5 | J7-4 | Close door 1contactor control output | | | | | |
| | COM2 | J7-5 | Y2～Y5common | | | | | |
| | Y6 | J7-6 | Braking control output | | | | | |
| | Y7 | J7-7 | Braking economical resistor control output | | | | | |
| | Y8 | J7-8 | Main inverter control output | | | | | |
| | Y9 | J7-9 | Running inverter control output | | | | | |
| | COM3 | J7-10 | Y6～Y9common | | | | | |
| **J8** | Y10 | J8-1 | Inverter up control output | Output | Relay | DC5A24V AC5A250V | 5/10mS | 20cpm |
| | Y11 | J8-2 | Inverter down control output | | | | | |
| | Y12 | J8-3 | Transducer enable output | | | | | |
| | Y13 | J8-4 | multi-segment given X1 control output | | | | | |
| | Y14 | J8-5 | multi-segment given X2 control output | | | | | |
| | Y15 | J8-6 | multi-segment givenX3 control output | | | | | |
| | COM4 | J8-7 | Y10～Y15common | | | | | |
| | VB | J8-8 | Load offset analog voltage output | | | -10V～+10V | | |
| | VS | J8-9 | Analog speed given voltage output | | | 0～10V | | |
| | GND3 | J8-10 | Analog output 0V | | | | | |
| **J9** | 15VB | J9-1 | 15V input | Encoder input | High-speed optical coupler | 12～15V | | |
| | 0VB | J9-2 | 0V | | | | | |
| | 5VB | J9-3 | 5V input | | | | | |
| | | J9-4 | Void | | | | | |
| | A | J9-5 | A phase pulse (push-pull output) | | | 0V/12～ | | 25kH |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | B | J9-6 | B phase pulse (push-pull output) | | | 15V 18mA | | |
| | A+ | J9-7 | A+ phase pulse (line drive) | | | | | |
| | A- | J9-8 | A- phase pulse (line drive) | | | 0～15V 40mA | | |
| | B+ | J9-9 | B+ phase pulse (line drive) | | | | | |
| | B- | J9-10 | B- phase pulse (line drive) | | | | | |
| **J10** | Y18 | 10-1 | Multi-function output | | Relay | DC5A24V AC5A250V | 5/10mS | 20cpm |
| | Y19 | J10-2 | Multi-function output | Output | | | | |
| | COM6 | J10-3 | Y18、Y19 common | | | | | |
| | | J10-4 | Standby | | | | | |
| | | J10-5 | Standby | | | | | |
| **J11** | +5V | J11-1 | 5V power output | RS232 Communication model D nine-pin socket | | | | |
| | RX2 | J11-2 | RS232 receiving communication wire | | | | | |
| | TX2 | J11-3 | RS232 transmitting communication wire | | | | | |
| | 0V | J11-5 | Communication wire 0V | | | | | |
| **CN1** | | | Hand manipulator interface | | | | | |

### 3.3.2. Car board BL2000-CZB
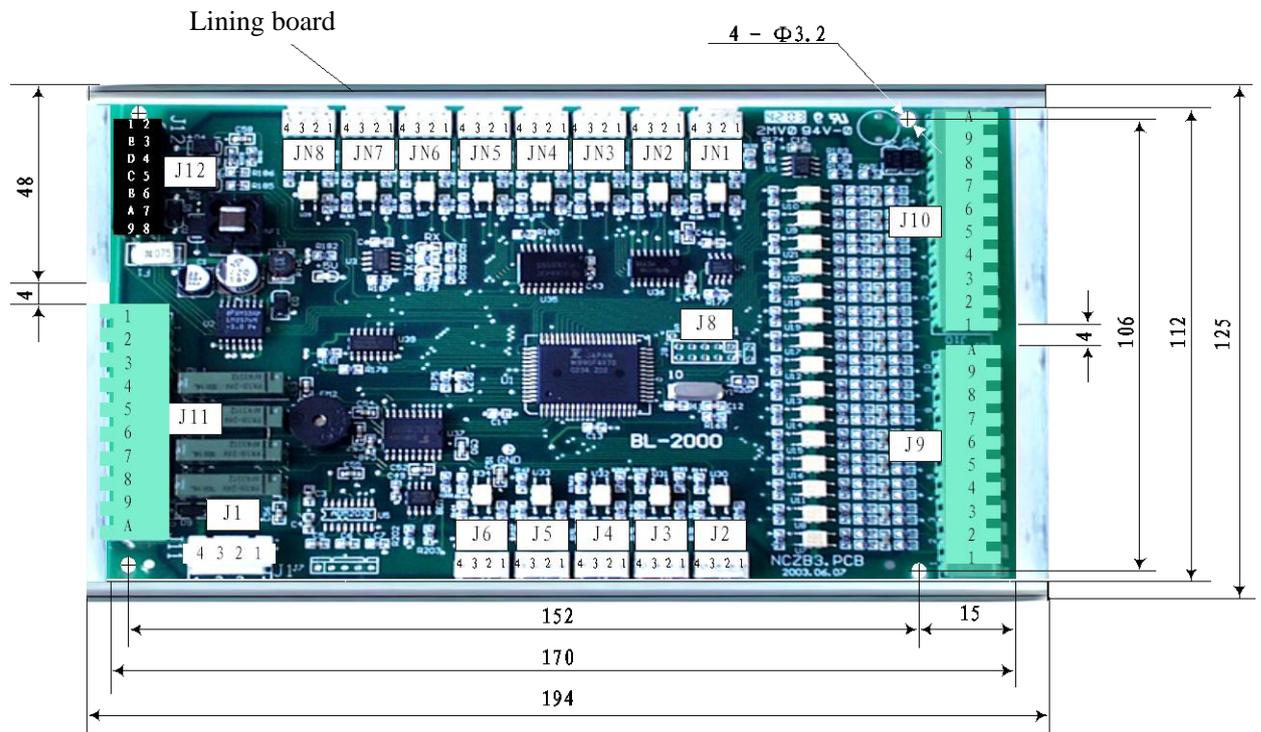


**Diagram 3-3-2-1 Appearance and layout installation dimension of car board BL2000-CZB**

## 1. Instruction

(1) Car call and response storeys

Besides basic input and output ports, Car board BL2000-CZB is provided with car call button and response port of 8 floors. When it is connected with car expansion board BL2000-CEB, the control of 64 floors can be achieved.

(2) Car internal display

Car internal display can be achieved by landing call and display board. For the layout of its ports, refer to Diagram 3-3-2-4. When landing call and display board is used for internal display, J1 is connected with car board J1, J2 and J3 are disconnected with wires, as well as the storey address is set on "0" (please refer to the setup of landing call and display board address).

## 2. Connector specification (BL2000-CZB-V7)

（1）J1 single-row socket 3.96/4P

（2）J2~J6, JN1~JN8 single-row pin 2.54/4P (single jacket)

（3）J7 single-row socket 2.54/5P

（4）J8 double-row hole socket 2.54/10P

（5）J9~J11 multi-wire swan neck socket DK5EHDRC-10P

　　　Rated voltage: 300V, rated current: 15A, voltage resistance: 4KV, pitch: 5mm.

（6）J12 double-row socket 2.54/14P

### 3 Port circuit

Please refer to **Diagram 3-3-2-2, Diagram 3-3-2-3** and **Diagram 3-3-2-4.**



**Diagram 3-3-2-2 Port circuit of car board BL-2000-CZB**



**Diagram 3-3-2-3 Wiring diagram of car callbutton**



**Diagram 3-3-2-4 Wiring diagram of car board and car expansion board**
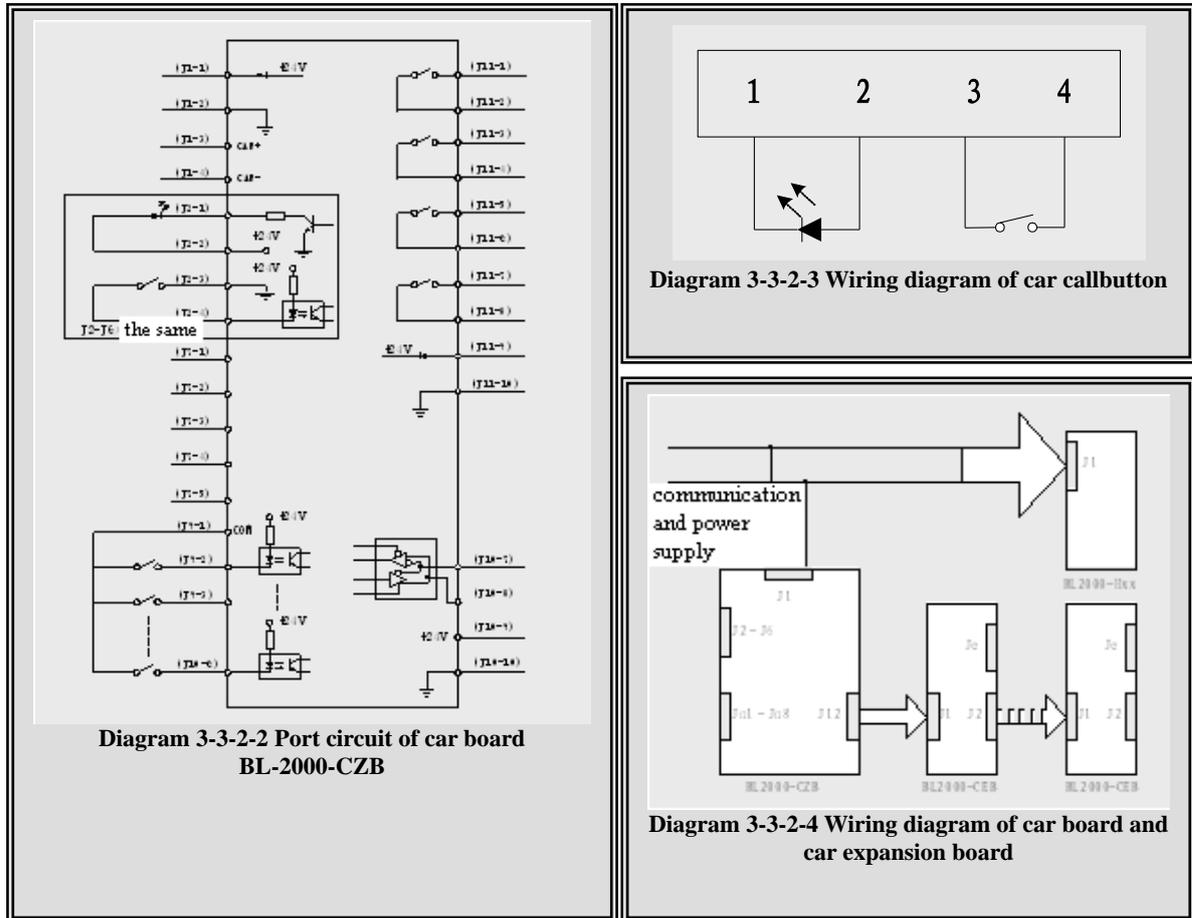
**Table 3-3-2- Definition and specification of port on car board BL2000-CZB**

| Name | Port | Location | Definition | Function | Port form | Rated load | Max. speed |
|------|------|----------|------------|----------|-----------|------------|------------|
| **J1** | | J1-1 | 24V input | Power and communication port | | | |
| | | J1-2 | 24V input ground | | | | |
| | | J1-3 | CAN bus H | | | | |
| | | J1-4 | CAN bus L | | | | |
| **J2** | | J2-1 | Open door button1 response | Open door button 1 and response | OC door | Current limit resistor 560Ω | |
| | | J2-2 | 24V output | | | | |
| | | J2-3 | 24V output ground | | | | |
| | | J2-4 | Open door button1input | | Optical coupler | 8mA | |
| **J3** | | J3-1 | Close door button1 response | Close door button 1 and response | OC door | Current limit resistor 560Ω | |
| | | J3-2 | 24V output | | | | |
| | | J3-3 | 24V ground output | | | | |

| | | J3-4 | Close door button1 input | | Optical coupler | 8mA | |
|---|---|---|---|---|---|---|---|
| **J4** | | J4-1 | Open door button 2 response | Open door button 2 and response (two door mode) | OC door | Current limit resistor 560Ω | |
| | | J4-2 | 24V output | | | | |
| | | J4-3 | 24V output ground | | | | |
| | | J4-4 | Open door button 2 input | | Optical coupler | 8mA | |
| **J5** | | J5-1 | Close door button2 response | Close door button 2 and response (two door mode) | OC door | Current limit resistor 560Ω | |
| | | J5-2 | 24V output | | | | |
| | | J5-3 | 24V ground output | | | | |
| | | J5-4 | Close door button 2 input | | Optical coupler | 8mA | |

**Continue Table 3-3-2**

| Name | Port | Location | Definition | Usage | Technical specification of port | | |
|---|---|---|---|---|---|---|---|
| | | | | | Port form | Rated load | Max. speed |
| **J6** | | J6-1 | Open door delay button response | Open door delay Button and response (selective) | OC door | Current limit resistor 560Ω | |
| | | J6-2 | 24V output | | | | |
| | | J6-3 | 24V output ground | | | | |
| | | J6-4 | Open door delay button input | | Optical coupler | 8mA | |
| **J7** | | J7-1 | RS232 receiving | RS232 communication | RS232 Electrical level | | |
| | | J7-2 | RS232 transmitting | | | | |
| | | J7-3 | Signal ground | | | | |
| | | J7-4 | RS232 output control | | | | |
| | | J7-5 | RS232 input control | | | | |
| **J8** | | | Programming port | | | | |
| **J9** | CMM | J9-1 | Common | Input | Optical coupler | 8mA | 500Hz |
| | KMV1 | J9-2 | Open door limit input | | | | |
| | GMV1 | J9-3 | Close door limit input | | | | |
| | KAB1 | J9-4 | Safety contactor 1 input | | | | |
| | CZ | J9-5 | Overload input | | | | |
| | MZ | J9-6 | Full load input | | | | |
| | KAB2 | J9-7 | Safety contactor 2 input | | | | |
| | QZ | J9-8 | Light load input | | | | |
| | KZ | J9-9 | 50% load input (emergency running direction) | | | | |
| | SZH | J9-10 | Attendant input | | | | |
| **J10** | SZY | J10-1 | Specific input | Input | Optical coupler | 8mA | 500Hz |
| | SZS | J10-2 | Passby input | | | | |
| | ZHS | J10-3 | Attendant running up | | | | |

| Name | Port | Location | Definition | Usage | Port form | Rated load | Max. speed |
|---|---|---|---|---|---|---|---|
| | ZHX | J10-4 | Attendant running down | | | | |
| | KMV2 | J10-5 | Open door limit 2 input | | | | |
| | GMV2 | J10-6 | Close door limit 2 input | | | | |
| | RT- | J10-7 | Serial load inspection communication RT- | SJT-150 serial input | RS485 | | |
| | RT+ | J10-8 | Serial load inspection communication RT+ | | | | |
| | 24V | J10-9 | +24V | | | | |
| | CMM | J10-10 | 0V | | | | |
| **J11** | BLV- | J11-1 | Arrival gong 1A | Output | Reply | DC5A24V AC5A250V | 20cpm Off/on time ≦ 5/10mS |
| | BLV+ | J11-2 | Arrival gong 1B | | | | |
| | N1 | J11-3 | Lighting control A | | | | |
| | ZM | J11-4 | Lighting control B | | | | |
| | BK1 | J11-5 | Standby 1 A | | | | |
| | BK2 | J11-6 | Standby 1 B | | | | |
| | CZD | J11-7 | Overload indicator light A | | | | |
| | CMM | J11-8 | Overload indicator light B | | | | |
| | 24V | J11-9 | Auxiliary power +24V input terminal | Input | | | |
| | 0V | J11-10 | Auxiliary power 0V input terminal | | | | |

**Continue Table 3-3-2**

| Name | Port | Location | Definition | Usage | Technical specification of port | | |
|---|---|---|---|---|---|---|---|
| | | | | | **Port form** | **Rated load** | **Max. speed** |
| **J12** | 24V | J12-1、2 | Power +24V input terminal | Car call expansion cascade | | | |
| | 5V | J12-3、4 | Power +5V input terminal | | | | |
| | 0V | J12-5、6 | Power 0V input terminal | | | | |
| | | J12-7～12 | Data signal wire | | | | |
| | | J12-13、14 | Void | | | | |
| **JN1 ～ JN8** | | JNn-1 | Response output | 1～8 floor Car call input and response output | OC door | DC24V20mA Current limit resistor 560Ω | |
| | 24V | JNn-2 | +24V | | | | |
| | 0V | JNn-3 | Ground | | | | |
| | | JNn-4 | Car call input | | Optical coupler | DC24V6mA | 50Hz |

### 3.3.3. Car expansion board BL2000-CEB
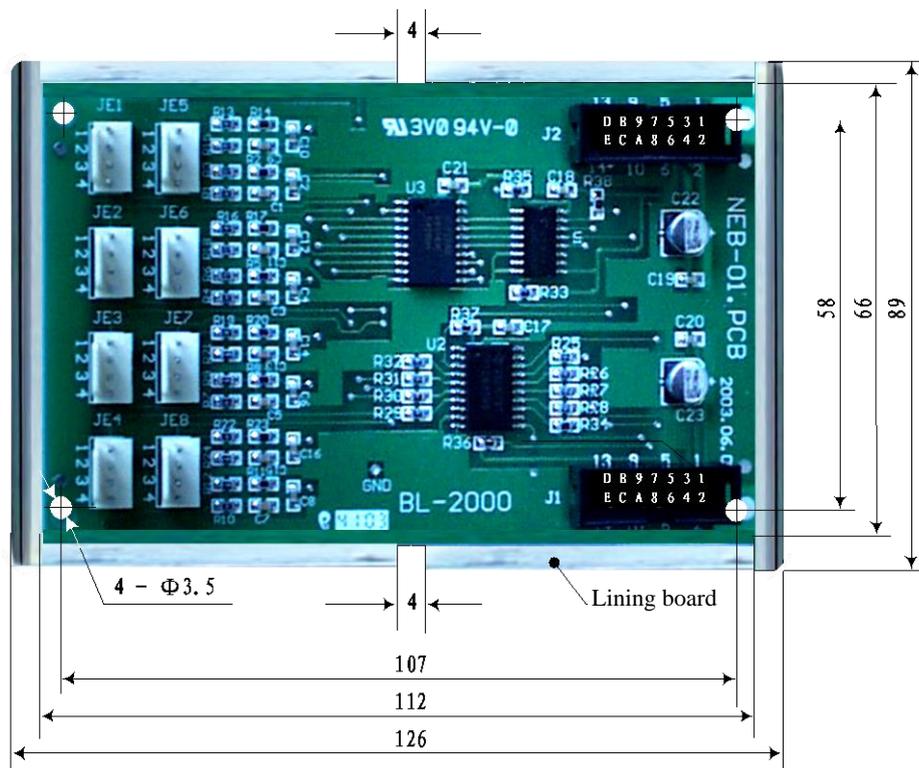


**Diagram 3-3-3-1 Appearance and layout installation dimension of car expansion board BL2000-CEB**

### 1. Instruction

**Car board BL2000-CZB** itself can connect with car call and response command signal of 8 floors; when the number of floors exceeds 8; it concatenates the **car expansion board BL2000-CEB** by port J12. Each car expansion board can increase the car call command for 8 floors. The car expansion boards themselves are cascade connection. The maximum number of the concatenated boards is 7.

### 2. Connector specification (BL2000-CEB-V1/V2)

（**1**）J1~J2 double-row socket 2.54/14P (DC2-04)

（**2**）JE1~JE8 single jacket and single-row pin 2.54/4P (2510-4P)

### 3. Port circuit
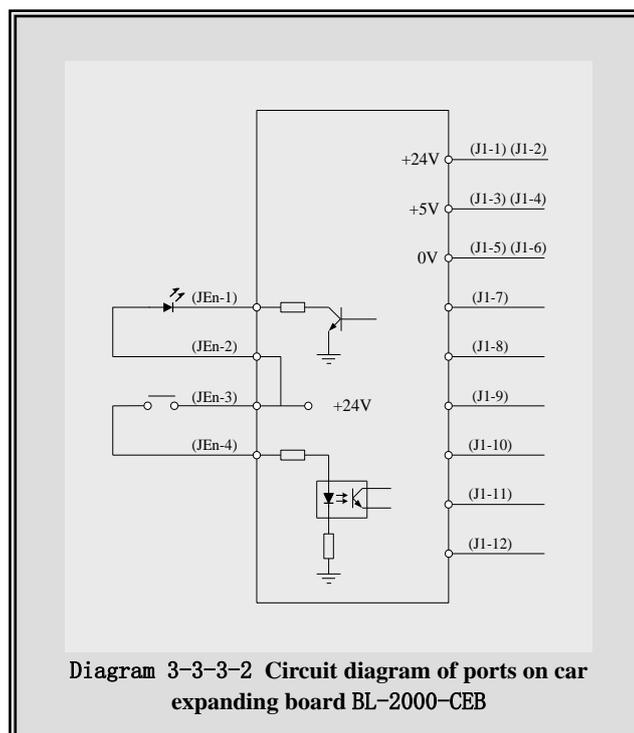


Diagram 3-3-3-2 **Circuit diagram of ports on car expanding board BL-2000-CEB**

## 4. Definition and specification of port

**Table 3-3-3 Definition and specification of ports on car expansion board BL2000-CEB**

| Name | Port No. | Location | Definition | Usage | Technical specification of port | | |
|---|---|---|---|---|---|---|---|
| | | | | | Port form | Rated load | Max. speed |
| **J1** | 24V | J1-1, J1-2 | Power +24V input terminal | Previous board port | | | |
| | 5V | J1-3, J1-4 | Power +5V input terminal | | | | |
| | 0V | J1-5, J1-6 | Power 0V input terminal | | | | |
| | | J1-7～J1-12 | Data signal wire | | | | |
| | | J1-13, J1-14 | Void | | | | |
| **J2** | | | The same with J1 | Next board port | | | |
| **JEN** | | JEn-1 | Response output | 8i+1～8i+8 floor car call input and response output port | OC door | DC24V20mA Current limit resistor 560Ω | |
| | 24V | JEn-2 | +24V | | | | |
| | 24V | JEn-3 | +24V | | | | |
| | | JEn-4 | Car call input | | Optical coupler | DC24V6mA | 50Hz |
| **Remark** | **"i" is the concatenation position of the car expansion board. Please refer to 3-2-2-2.** | | | | | | |

### 3.3.4. Landing call and display board BL2000-Hxx-xn

BL2000-HCH-F1      BL2000-HAH-B1      FJ-LCD vertical display      BL2000-HAx-A3      BL2000-HAH-C1

BL2000-HBH-E1      FJ-LCD horizontal display      BL2000-HDH-F1

**Diagram 3-3-4-1 Photos of BL2000 serial products of call and display boards**
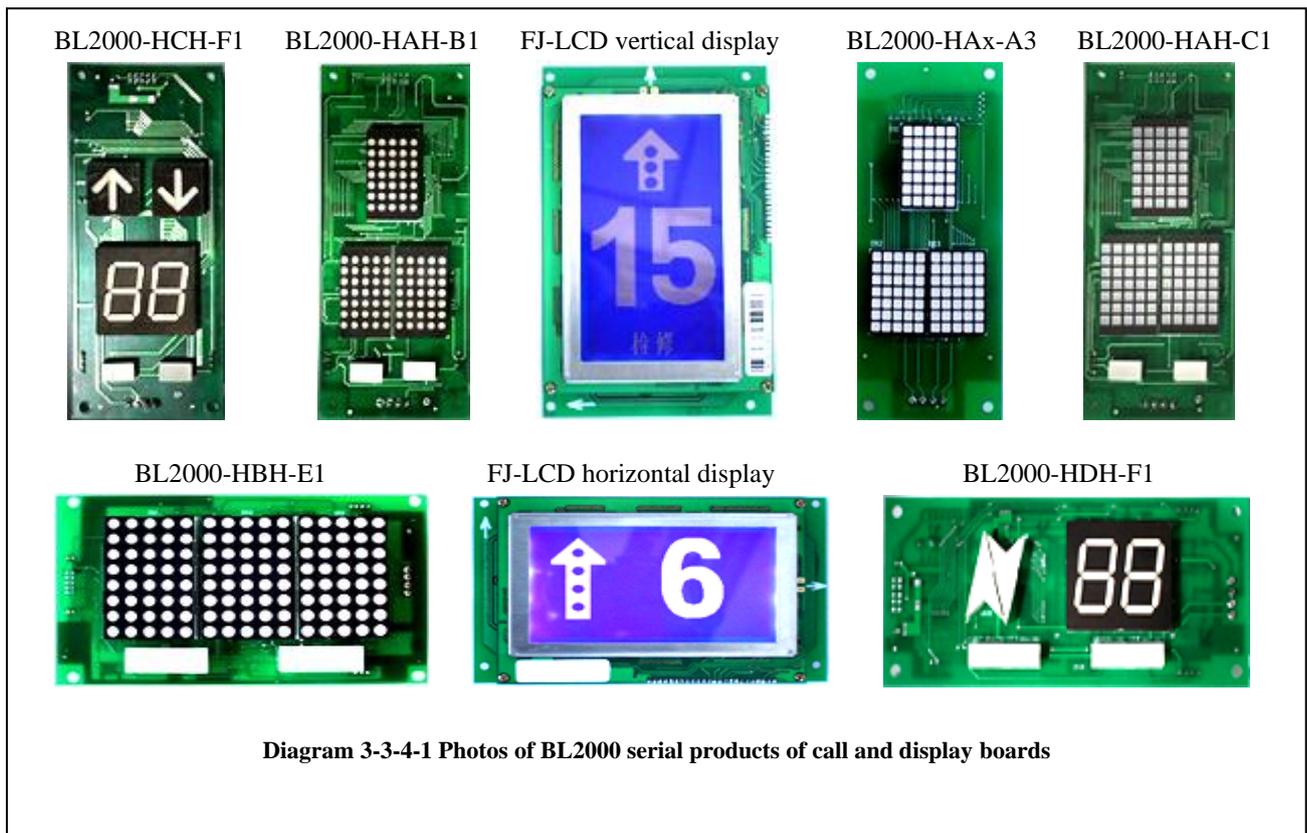
### 1. Instruction

Landing call and display board BL2000-Hxx-xn can be classified to be a lot of kinds: vertical display type and horizontal display type according to alignment of running direction display block and floor display block; point array display and 7-segment display according to the lighting of display block; big point array, small-point array, square-point array, high light, over light and over high light types according to the size, appearance and lightness of the point. For practical use, please refer to 3-3-4-1.

### 2. Specification of connector (BL2000-Hxx)

（**1**）J1, single-row socket 3.96/4P port circuit

（**2**）J2, J3 single-row pin 2.54/4P (single-jacket )

（**3**）J4 double-row hole socket 2.54/10P

（**4**）S1,CZ, JC skip wire 2P

### 3. port circuit

**Diagram 3-3-4-1 Connection diagram of port on BL-2000-Hxx**
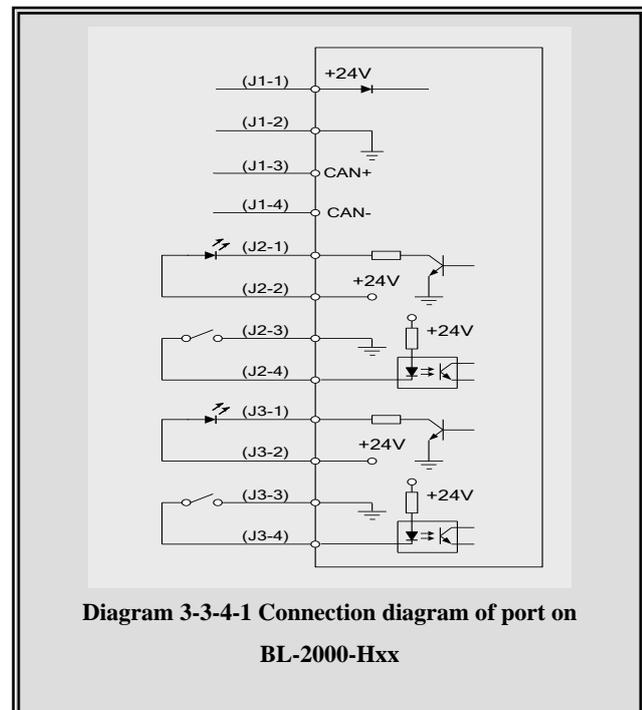
## 4. Definition and specification of port

**Table 3-3-4-2 Definition and specification of ports on landing call and display board BL2000-Hxx**

| Name | Location | Definition | Usage | Technical specification of port | | |
|---|---|---|---|---|---|---|
| | | | | Port form | Rated load | Max. speed |
| **J1** | J1-1 | 24V power input | Power and communication port | | Point array 100mA 7-segment 160mA | |
| | J1-2 | 24V power input ground | | | | |
| | J1-3 | CAN bus H | | | | |
| | J1-4 | CAN bus L | | | | |
| **J2** | J2-1 | Up call response | Up running call button input and response voltage output | OC door | Current limit resistor 120Ω | |
| | J2-2 | 24V output | | | | |
| | J2-3 | 24V output ground | | | | |
| | J2-4 | Up call input | | Optical coupler | 8mA | 50Hz |
| **J3** | J3-1 | Down call response | Down running call button input and response voltage output | OC door | Current limit resistor 120Ω | |
| | J3-2 | 24Voutput | | | | |
| | J3-3 | 24V ground output | | | | |
| | J3-4 | Down call input | | Optical coupler | DC24V8mA | 50Hz |
| **J4** | Programming port | | | | | |
| **S1** | Skip wire for serial communication terminal resistance (in board) | | | | | |
| **AN** | Address setup key (in board) | | | | | |

## 5. The setup of landing call and display board address

Because of the serial communication management for each unit in the system, each communication unit can have only one address. Address setup can be enabled with the inspection of the display of point array digital code block and AN key: car display panel address is set to 0, landing call and display board can set address according to the absolute floor (1-64 floor); the bottom floor can be set to 1, the second bottom address set to 2 and so on.

（1）Press button **AN** for seconds to display the set unit address. After 5 second, it can enter the **address setup state**.

（2）In the **address setup state**, address will increase by 1 if AN button is pressed one time until the address is 64; then it recycles.

（3）Release the button 2 seconds later when the address is set, the address indicator will be twinkling and the setup will be saved.

（4）Skip wire S1 being short connected by short circuit block means communication terminal resistor is connected.

▲**Note: only the landing call and display board of the bottom floor (address number is 1) can be connected with terminal resistor.**

▲**Note: because of the different types, please refer to the supplied documents as the standard.**

# 7. Appearance and layout installation dimension
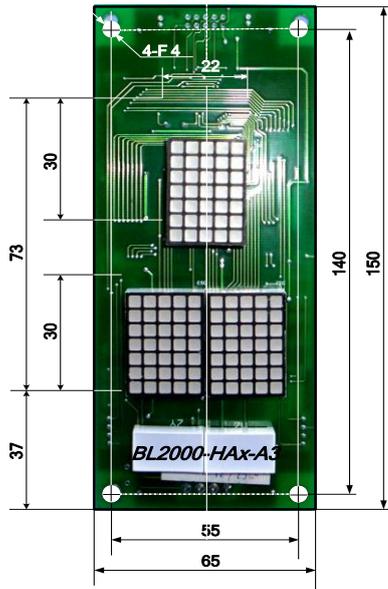


**Diagram 3-3-4-2**
**BL2000-HAx-A3 Appearance and layout installation dimension**
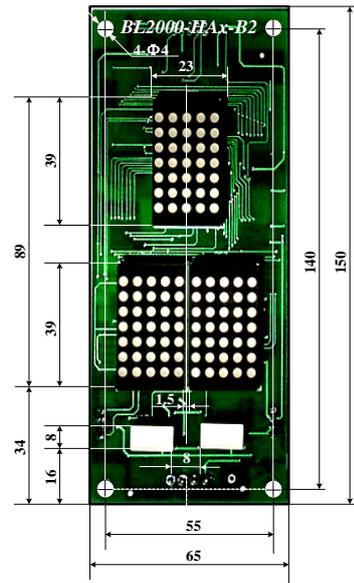


**Diagram 3-3-4-3**
**BL2000-HAx-B2 Appearance and layout installation dimension**
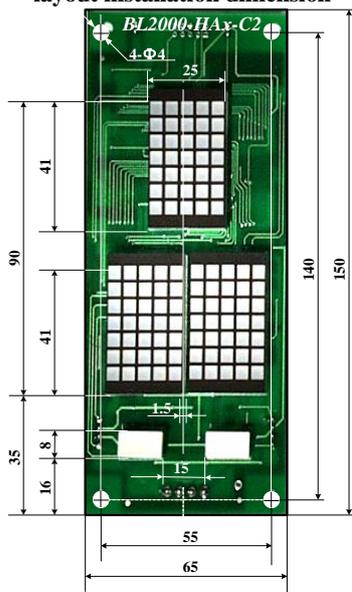


**Diagram 3-3-4-4**
**BL2000-HAx-C2 Appearance and layout installation dimension**
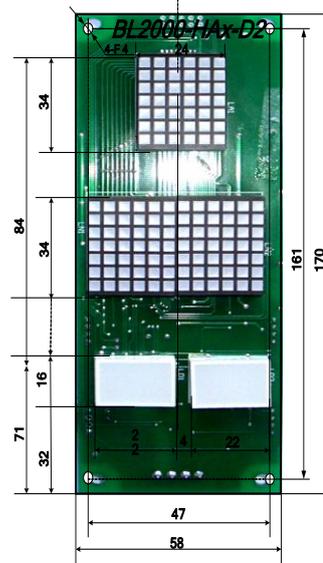


**Diagram 3-3-4-5**
**BL2000-HAx-D2 Appearance and layout installation dimension**
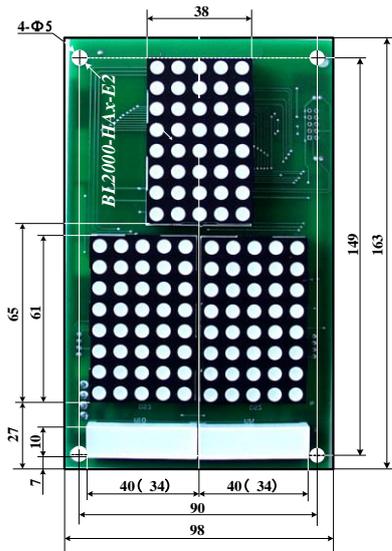
**Diagram 3-3-4-6 BL2000-HAx-E2 Appearance and layout installation dimension**
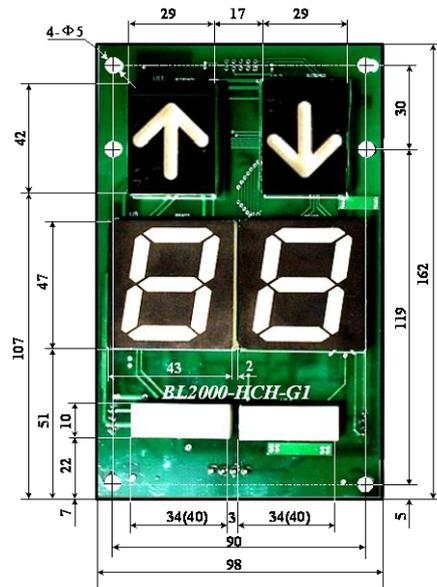


**Diagram 3-3-4-7 BL2000-HCH-G1 Appearance and layout installation dimension**
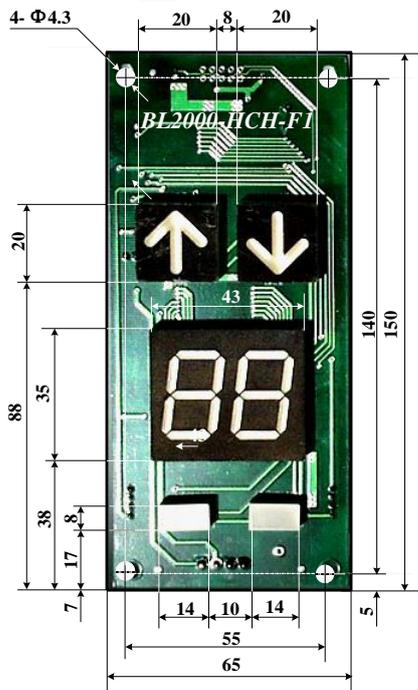


**Diagram 3-3-4-8 BL2000-HCH-F1 Appearance and layout installation dimension**
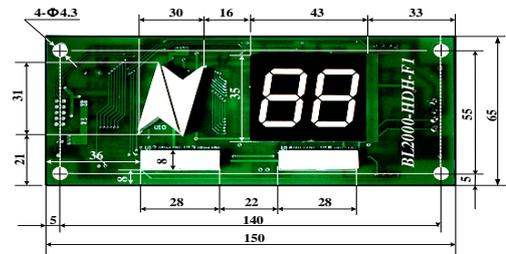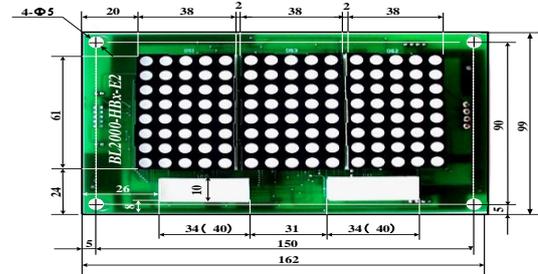


**Diagram 3-3-4-9, 10 BL2000-HBx-E2, HDH-F1 Appearance and layout installation dimension**

## 8. List of types and specification

**Table 3-3-4-1 Types and specifications of landing call and display board BL2000-Hxx**

| Type | Specification of display block | | | | | | |
|------|------|-----------|------------|-----------|-------|----------|-----------|
| | Type | Alignment | Appearance | Form | Color | L×W×H mm | Lightness |
| BL2000-HAH-A3 | 1357AH | Vertical display | Square point | Point array | | 30×22×10 | High light |
| BL2000–HAS–A3 | 1357AS | | | | | | Over light |
| BL2000–HAR–A3 | 1357ASR | | | | | | Over high light |
| BL2000–HAH–B2 | 1057AH | Vertical display | Small point | Point array | | 39×23×8 | High light |
| BL2000–HAS–B2 | 1057AS | | | | | | Over light |
| BL2000–HAR–B2 | 1057ASR | | | | | | Over high light |
| BL2000–HAH–C2 | 1257AH | | Square point | Point array | | 42×25×7 | High light |
| BL2000–HAS–C2 | 1257AS | | | | | | Over light |
| BL2000–HAR–C2 | 1257ASR | | | | | | Over high light |
| BL2000–HAH–D2 | 1067BH | | Square point | Point array | | 34×24×6 | High light |
| BL2000–HAH–E2 | 2058AH | | Large point | Point array | | 61×38×8 | High light |
| BL2000–HAS–E2 | 2058AS | | | | | | Over light |
| BL2000–HAR–E2 | 2058ASR | | | | | | Over high light |
| BL2000–HBH–C1 | 1257AH | Horizontial display | Square point | Point array | | 42×25×7 | High light |
| BL2000–HBS–C1 | 1257AS | | | | | | Over light |
| BL2000–HBR–C1 | 1257ASR | | | | | | Over high light |
| BL2000–HBH–E2 | 2058AH | Horizontial display | Large point | Point array | | 61×38×8 | High light |
| BL2000–HBS–E2 | 2058AS | | | | | | Over light |
| BL2000–HBR–E2 | 2058ASR | | | | | | Over high light |
| BL2000–HCH–F1 | BS252 | Vertical display | Segment | 7 segment | | 35×42×h | Arrow dimension 22×20 |
| BL2000–HCH–G1 | BS402 | | | | | 46×44×10 | |
| BL2000–HDH–F1 | BS252 | Horizontial display | | | | 35×42×h | |

### 3.3.5. Group control landing call board BL2000-HQK
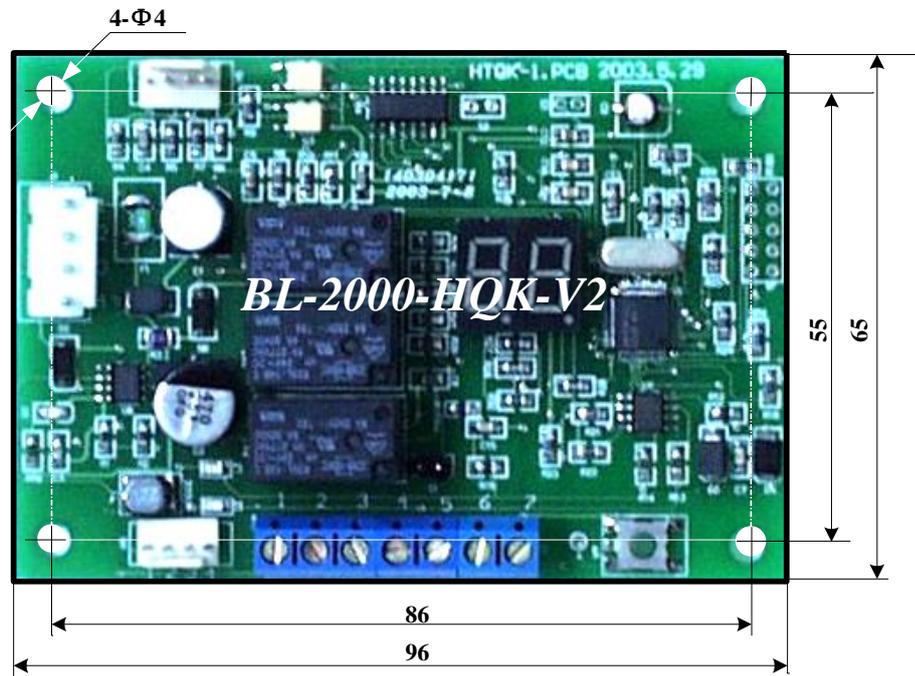


**Diagram 3-3-5 Appearance and layout installation dimension of group control landing call board BL-2000-HQK**

### 1. Instruction

When BL3000 control system is of group control, **group control landing call board BL2000-HQK** particularly for group control can be used without display outside the hall.
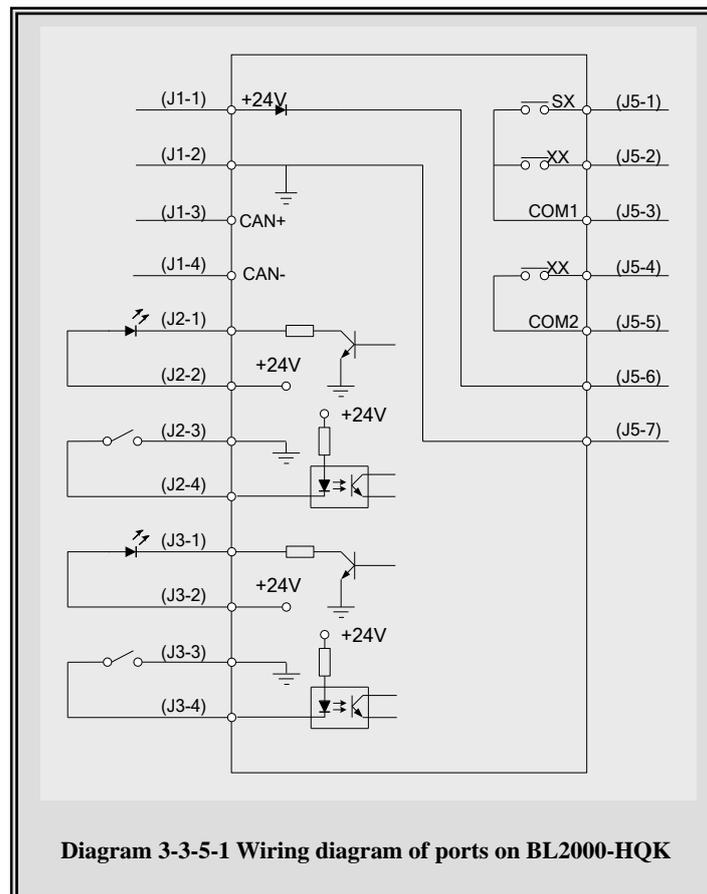


**Diagram 3-3-5-1 Wiring diagram of ports on BL2000-HQK**

**2. Specification of connector (BL2000-HQK-V1/V2)**

（**1**）J1 single-row socket 3.96/4P

（**2**）2.54/4P

（**3**）SH, XH single-row socket 2.54/4P (single jacket )

（**4**）J4 double-row hole socket 2.54/10P

（**5**）J5-0 terminal DG301-3P (5.08/3P)

（**6**）J5-1, J5-2 terminal DG301-2P (5.08/2P)

（**7**）S1 skip wire 2P

**3. Port circuit**

Please refer to Diagram 3-3-5-1 Wiring diagram of ports on BL2000-HQK

**4. Definition and specification of ports**

Table 3-3-5 Definition and specification of ports on group control landing call board BL2000-HQK

| Name | Location | definition | Usage | technical specification of port | | |
|---|---|---|---|---|---|---|
| | | | | port form | rated load | Max. speed |
| **J1** | J1-1 | 24V power input | Power and communication | | Point array 100mA 7-segment 160mA | |
| | J1-2 | 24V power ground input | | | | |
| | J1-3 | CAN bus H | | | | |
| | J1-4 | CAN bus L | | | | |
| **J2** | J2-1 | Up call response | Up running call button input and response voltage output | OC door | Current limit resistor 120Ω | |
| | J2-2 | 24V output | | | | |
| | J2-3 | 24V ground output | | | | |
| | J2-4 | Up call input | | Optical coupler | 8mA | 50Hz |
| **J3** | J3-1 | Down call response | Down running call button input and response voltage output | OC door | Current limit resistor 120Ω | |
| | J3-2 | 24V output | | | | |
| | J3-3 | 24V ground output | | | | |
| | J3-4 | Down call input | | Optical coupler | DC24V8mA | 50Hz |
| **J4** | Programming port | | | | | |
| **J5** | J5-1 | Up running light output | Output | Relay | DC5A24V AC5A250V | 20 cpm Off/on time ≦5/10mS |
| | J5-2 | Down running light output | | | | |
| | J5-3 | Up and down running lights output common | | | | |
| | J5-4 | Arrival gong output | | | | |
| | J5-5 | Arrival gong output common | | | | |
| | J5-6 | 24V output | | | | |
| | J5-7 | 24V power ground | | | | |
| **S1** | Skip wire of serial communication terminal resistor    (in board) | | | | | |
| **AN** | Address setup button    (in board) | | | | | |

### 3.3.6. Group control board BL2000-QKB-V1
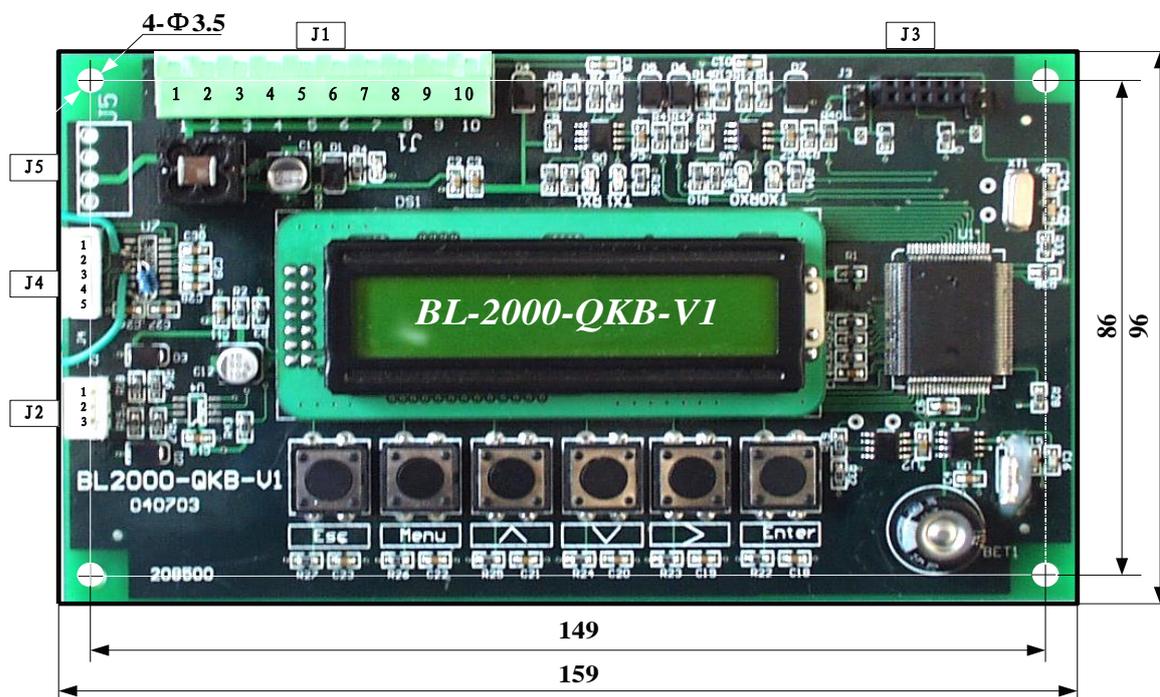


**Diagram 3-3-6 Appearance and layout installation dimension of group control board BL2000-QKB-V1**

### 1. Instruction

（**1**）Group control system is composed of group control board **BL2000-QKB-V1** and boards (**BL3000—xxx**) on each elevator. Group control board collects the landing call, car call and state information of each elevator by **CAN** bus serial communication (Diagram 3-3-6-1), processes the information intelligently, and then assign the commands to all the elevators to group control 8 elevators below 64 stories.

（**2**）Four running modes

◆ Up peak mode——all the elevator supply landing call service with the preference of landing floor up call in the set time.

◆ Down peak mode——one elevator preferentially supplies up call service and other elevators preferentially supply down call service with zone allocation to respond to the down call as quickly as possible.

◆ Balance mode——fine preference and assign for landing call; respond the landing call at the minimum time.

◆ Free mode——if there is no selective landing call in balance mode for 3 minutes, the elevator will wait on the first floor of each zone equally so as to response to any landing call as quickly as possible.

◆ If one elevator is in states of malfunction, inspection, station, fire control and special purpose, it will be out of the group control. For the running function and setup of each elevator in group control, please refer to the relative chapters in the manual or "adjustment and maintenance specification of SJT-WVF 5 elevator control system".

### 2. Scope of application

（**1**）Group control of 3-8 elevators;

（**2**）Range of speed: 0.5-4m/s；

（**3**）Applicable storeys: below 64 storeys；

（**4**）Passenger elevator, freight elevator, bed elevator and residential elevator.

### 3. Specification of connector

（**1**）J1multi-wire swan pin socket DK5EHDRC-10P

  Rated voltage: 300V, rated current: 15A, pressure resistance: 4KV, pitch: 5mm.

（**2**）J2 connector 2.54/3P

（**3**）J3 double-row hole socket 2.54/10P

（**4**）J4 connector 2.54/5P

（**5**）J5 single jacket plug 3.96/4P

### 4. Port circuit
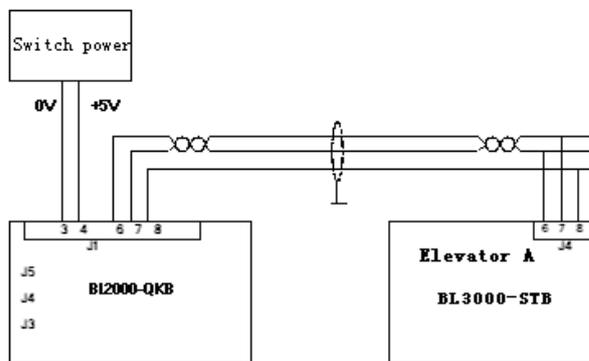


**Diagram 3-3-6-1 Wiring diagram of ports on group control board BL2000-QKB-V1**

### 5. Definition and specification of port

**Table 3-2-6 Group control board BL2000-QKB-V1 port**

| Name | Port No. | Location | Definition | Usage | Technical Specifications | | |
|------|----------|----------|------------|-------|-----------|-----------|-----------|
| | | | | | Port Form | Rated Load | Max. Speed |
| **J1** | GND3 | J1-1 | 0V | Power and communication | | | |
| | | J1-2 | | | | | |
| | GND3 | J1-3 | 0V | | | | |
| | 5V IN | J1-4 | 5V input | | | 200mA | |
| | | J1-5 | | | | | |
| | TXA+ | J1-6 | Group communication | | | | |
| | TXA- | J1-7 | | | | | |
| | GND3 | J1-8 | 0V | | | | |
| | | J1-9 | Standby CAN communication TXA+ | | | | |
| | | J1-10 | Standby CAN communication TXA- | | | | |
| **J2** | DA+ | J2-1 | | RS485 | | | |
| | DA- | J2-2 | | | | | |
| | GND | J2-3 | | | | | |

| J3 | | | Programming port | | | | |
|---|---|---|---|---|---|---|---|
| **J4** | TX | J4-1 | Communication transmit | RS323 | | | |
| | RX | J4-2 | Communication receive | | | | |
| | IN | J4-3 | Control input | | | | |
| | OUT | J4-4 | Control output | | | | |
| **J5** | TXA+ | J5-1 | Group control communication | | | | |
| | TXA- | J5-2 | | | | | |
| | GND3 | J5-3 | 0V | | | | |
| | | J5-4 | | | | | |

### 3.3.7. Introduction of load inspection device SJT-150

**1. Working principle**

Under the principle that: bottom car elastically changes with the weight, the device inspects the changes of displacement by Hall sensor, calculates by the single chip computer and corrects error so as to inspect the load of the elevator car.

**2. Description of features**

（**1**）Non-contacting sensing mode, without mechanical running itself and without the structural changes of elevator car.

（**2**）Equipped with Hall sensor of high precision and single chip computer of high quality; working parameters can beset at site.



**Diagram 3-3-7 Load inspection device SJT-150**

（**3**）Self-learning and convenient adjustment at site.

（**4**）Serial output, working as landing call box.

（**5**）Small volume, easily mounting and simple structure.

（**6**）Matching with BL3000; being used for load compensation of drive to solve the problem of sliding of gearless towing machine when starting.

**3. Technical index and specification**

（**1**）Scope of application: movable bottom car elevator, effective sensing range of magnetic filed: 2-24mm.

（**2**）Sensibility:

**Table 3-3-7**

| Distance between bottom car and load inspection device when idling | 24mm | 20mm | 10mm |
|---|---|---|---|
| Motivating range of bottom car from idling to full load | ＞＝9mm | ＞＝7mm | ＞＝3mm |
| Sensibility | Rated loading weight /200 | | |

（**3**）Response time: ≤0.5s

（**4**）Output form: RS485 serial single byte output

（**5**）Power supply voltage : DC 9 - 24V

**4. Operating instruction**

The device should be used with serial control systems of **BL3000** serial communication frequency control elevator. In normal working state, load inspecting value can take part in the controlling of system, which can achieve the functions of torque compensation, full load passby, overload voice and light alarms performed.

(For details, please refer to the *Specification of SJT–150 Elevator Load Inspecting Device*.)

**5. Definition and specification of ports**

<div align="center"><b>Table 3-3-8-1 Load Inspecting Device SJT-150</b></div>

| Name | Port No. | Location | Definition | Usage | Technical Specification | | |
|---|---|---|---|---|---|---|---|
| | | | | | Port Form | Rated Load | Max. Speed |
| | | DB9-3 | RT- | Power and communication | RS485 | | |
| | | DB9-7 | RT+ | | | | |
| | | DB9-4 | 24V | | | | |
| | | DB9-1 | CMM | | | | |

### 3.3.8. Introduction of voice synthesizer SJT-YBA

**1. Description of features**

Languages such as Chinese and English can be selected; broadcasting the running direction, landing floor and background music. No elevator adjustment. Broadcast advertisement according to customer's requirement.

**2. Technical index and specification**

(1) Language selection

(2) Broadcasting content of floor landing

(3) Background music selection

(4) Salutatory (less than 15 characters)

**3. Optional voice selection**



**Diagram 3-3-8 Voice synthesizer SJT-YBA**

Customer can select language, background music and advertisement (for details please refer to the *Specification of SJT-YBA Voice Synthesizer*).

**4. Definition and specification of port**

<div align="center"><b>Table 3-3-8-2 SJT-YBA Voice Synthesizer</b></div>

| Name | Port No. | Location | Definition | Usage | Technical Specifications | | |
|---|---|---|---|---|---|---|---|
| | | | | | Port Form | Rated Load | Max. Speed |
| J1 | 24V | J1-1 | 24V input power | Power and communication | CAN | 800mA | |
| | 0V | J1-2 | 0V | | | | |
| | CANH | J1-3 | CAN communication C+ | | | | |
| | CANL | J1-4 | CAN communication C- | | | | |

# Chapter 4 The Installation of BL3000 Serial Control System

## 4.1. Important notes

**1.** The products made in our company have been strictly inspected through automatic inspection line and usually can be can be normally installed and used, except for some accidental damages during the transportation process (please refer to the content of "**Arrival Check**" in this manual).

**2.** The users who have bought our products are expected to carefully read the manual and the manuals related to the system or that for the equipment that are used for this system before the installation and assembly, and carry out the installation and assembly according to the instructions in this manual, the enclosed documents and the manuals related to the system or that for the equipment that are used for this system , to avoid the accidental losses.。

**3.** The users who have bought the bare control system and board products of our company are expected to, besides some relevant functional features, carefully understand the scope of application, application condition, performance, installation dimension, interface parts type and its specification and technical requirements of the installation to avoid the accidental losses.

**4.** If the content of this manual can not satisfy your demand, please immediately contact our company for instant assistance for avoiding the accidental losses during the installation and usage.

## 4.2. Incoming inspection

**1.** Before opening the packaging firstly check the arrival list, dispatch list against the actual packages (volume , weight and so on)；

**2.** Before opening the packaging, check if there is any breakage on the packaging and if there is any possibility that the internal parts are broken；

**3.** Check if the original sealing of the packaging are broken (including external and internal packaging)；

**4.** After opening the packaging, check if the appearance of the internal parts is in bad condition；

**5.** Check if the packing list is consistent with the order;

**6.** Check the contents of the packing list with the parts names, specification, types and quantity；

**7.** Other abnormal conditions.

▲Note：**In case any of the above circumstances, please contact the consigner or our company.**

## 4.3. System installation

### 4.3.1. Technical requirements for installation

**1.** Please install the elevator according to *GB7588-2003 Elevator Manufacture and Installation Regulation*.

**2.** Please install the elevator according to the installation technical requirements in the introduction of the system (parts) and connecting equipment (apparatus).

**3.** Please confirm that the installation environment can not adversely affect the system (parts) and the installation result.

**4.** Please confirm that the installation staffs are qualified for the installation of the system (parts).

**5.** For the equipment for which technical requirements are not covered in the manual, please conduct the installation according to the practices related to the industry or the profession.

### 4.3.2 Installation of BL3000 series parts

### 1. The installation of the circuit board

（**1**）Note the direction (for example, the **J1~J5** of main board are at the upper place, and **J6~J10** are at the lower place)；

（**2**）The scaleboards (enclosed accessories) should be installed on the main board, car board, car expansion board, landing call and display board；

（**3**）Do not twist (in order not to damage the circuit board), especially when fastening the screw in the board installation process；

（**4**）Guarantee the insulation between circuit board and lining board.

### 2. Installation of connector

（**1**）Line check: before connecting, please according to the interface definition list confirm that the connecting cables are connected with the connector pins and pins are insulated to each other (except for those that should be connected.)

（**2**）Connector check: before connecting, please check if the plugs can match the sockets and if the pin is bended or vacant and the jack is unobstructed；

（**3**）Correct connection: please note the corresponding number (serial numbers) when connecting；

（**4**）Please make sure to connect properly and confirm that there is no gap between and plug and socket.

### 3. Please pay attention to distinguish the common, power grounding and external grounding.

### 4.3.3. Installation of other parts of the system

**1.** Installation and connection of rotary encoder

The rotary encoder is the most important detecting element in the elevator control system, whose installation quality will directly affect the system performance. Generally, the PM manufacturer should be consigned to install the rotary encoder according to the requirements. If self installation is needed, pay attention to the following points:

（**1**）When the countershaft type rotary encoder is used, please install it at the bottom of the PM and make it coaxial coupled with the shaft head at this place by flexible shaft coupling to guarantee the concentricity of PM shaft and encoder shaft (please refer to the content about the installation in the instruction of the encoder), or else it will cause the unstable output pulse of the encoder and further affect the smoothness of the elevator speed or damage the coupling; The screw on the coupling must firmly screw at the platform of the two side shafts to prevent slipperiness and rotation loss; The loose coupling will make the wrong system feedback and the elevator will shake or not land.

（**2**）If there is no connecting shaft head at the bottom of the PM, please choose the sleeve shaft type encoder and install it on the motor shaft; When making an order, please determine the installation dimension (shaft diameter) of the motor shaft；When installing，don't heavily knock it for preventing the breakage of the glass disk inside the encoder; the installed encoder should not apparently shake when the motor is rotating.

（**3**）The encoder cables should correspondingly connect with the appointed ports of the inverter and appointed ports of the main board. Wrong wire connection will damage the rotary encoder；The cables of the rotary

encoder should be covered inside the metal tube and kept away from the power wires.

（4）Please refer to the relevant parts of the enclosed electric diagram for specific connections.

▲Note: The shield layer of the encoder cables must not be connected with the earth line of the PM.

**2.** Landing switch and the installation and adjustment of landing bridge plate

Two landing switches and several landing bridge plates (each for every floor) can control the elevator leveling. The two landing switches should be installed on the top of the car, the bridge plate of the landing should be installed in the hoistway, please see the diagram 4-3-3-1 for its dimension and installation position: the landing switch can adopt photoelectric switch or magnetic switch.



图 4-3-3-1 门区开关与门区桥板安装示意图
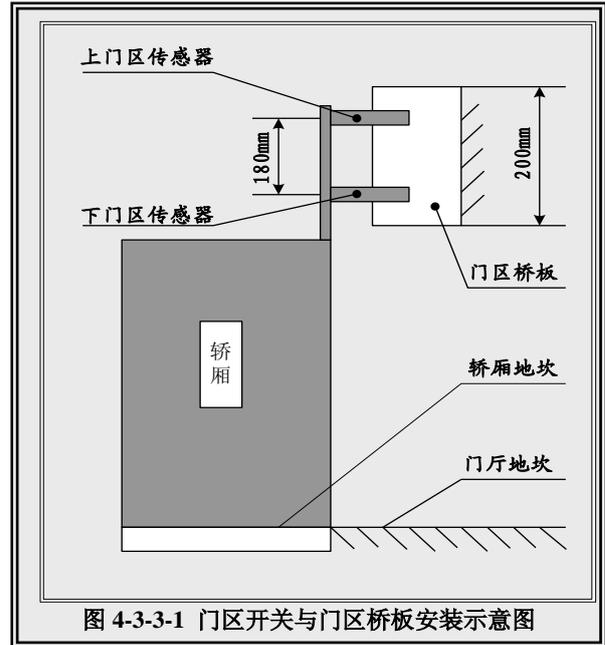
上门区传感器　upper landing sensor

下门区传感器　lower landing sensor

门区桥板　landing bridge plate

轿厢地坎　car sill

图 4-3-3-1 门区开关与门区桥板安装示意图
Diagram 4-3-3-1 Installation diagram of landing switch and landing bridge plate

**3.** The installation and adjustment of upper or lower terminal switch

（1）When the elevator speed is lower than 1.75 m/s, there is one terminal switch and one terminal bridge plate separately on the upper and lower terminal.

（2）The upper and lower terminal switches should be installed in the hoistway, the terminal bridge plate should be installed on the top of the car.

（3）The upper and lower terminal switches should be located at the switch action position when the car sill is 2.5 m away from the top (bottom) sill (the elevator speed is smaller than 1.75 m/s).

（4）When the elevator speed is equal to or over 2.0 m/s, please add the terminals so as to take some safety protection measures. See the following list for the concrete installation position.

（5）Untouched type inductive switch is recommended to be used as the terminal switch, such as the magnetic switch.

（6）Please see the diagram **4-3-3-2 and 4-3-3-3**

**Table 4-3-3 Reference table of upper/lower terminal installation position when the elevator runs in different speeds**

**(Simulative Setup)**

| Elevator speed<br><br>Terminal<br>station name | The installation position of the terminal | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | 0.5m/s | 1.0m/s | 1.6m/s<br>1.75m/s | 2.0m/s | 2.5m/s | 4.0m/s |
| Upper/lower terminal 1 | 1m | 1.3m | 2.5m | 2.5m | 2.5m | 2.5m |
| Upper/lower terminal 2 | | | | 4m | 6.25m | 8m |
| Upper/lower terminal 3 | | | | | | |

**Diagram 4-3-3-2**

**Installation Diagram of the Upper Terminal Switch**

**(the elevator speed is 1.6 m/ s or 1.75 m/s)**

**Diagram 4-3-3-3**

**Installation Diagram of the Lower Terminal Switch**

**(the elevator speed is 1.6 m/ s or 1.75 m/s)**
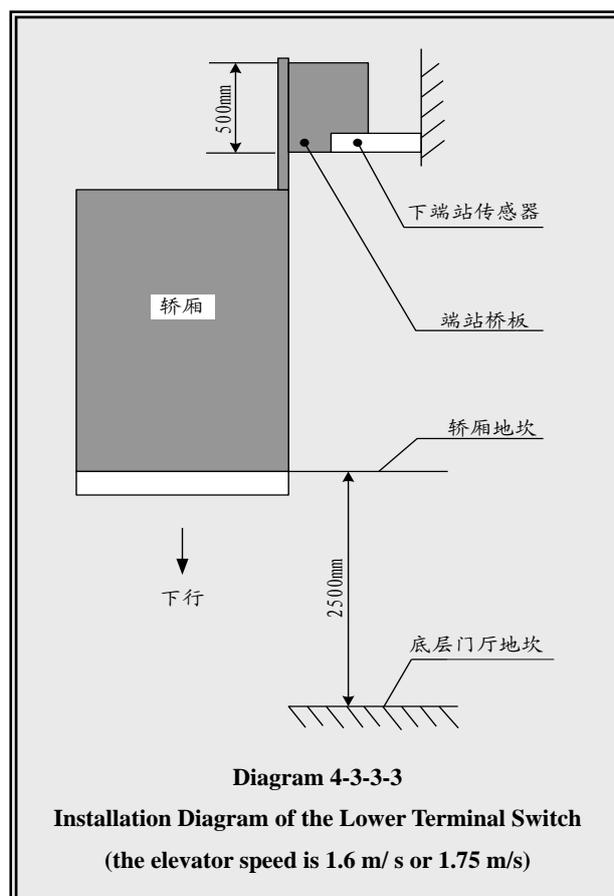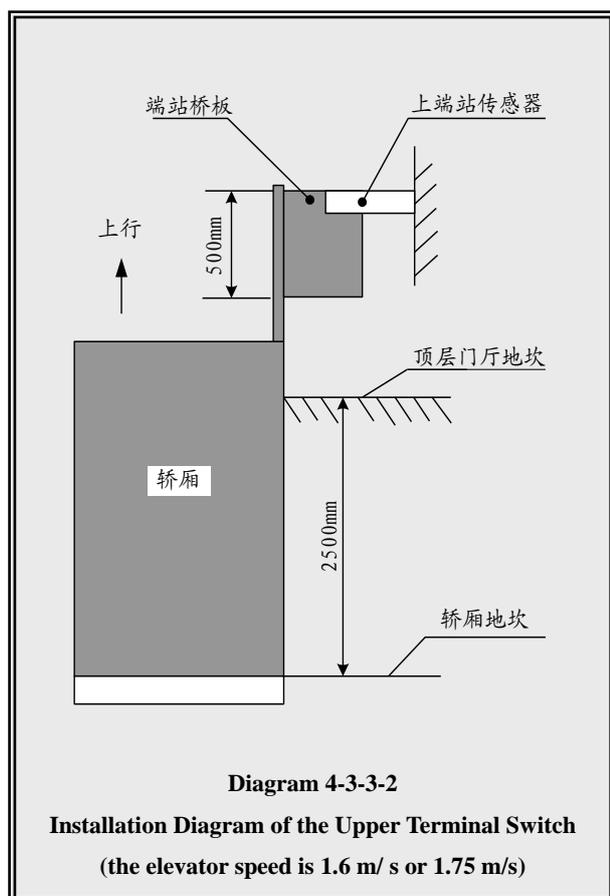
上行 up

端站桥板 bridge plate of the terminal

上端站传感器 sensor of upper terminal

顶层厅门地坎 landing door sill of the top floor

轿厢地坎 car sill

轿厢 car

下行 down

端站桥板 bridge plate of the terminal

下端站传感器 sensor of lower terminal

底层厅门地坎 landing door sill of the bottom floor

轿厢地坎 car sill

轿厢 car

The installation position of the terminal when the multi speeds are given has something to do with the setting of the speed changing distance of the segment speed:

0.5m/s：The installation of terminal =S1, the speed changing distance of the highest running speed, set by main board, ranging from 0.3 m to 0.5 m.

1.0m/s：The installation of terminal = S1, the speed changing distance of the highest running speed, set by main

board, ranging from 1 m to 1.5 m.

1.6～1.75m/s：If the floor space is big enough, the terminal installation distance can be equal to S1, if not, the installation distance can be higher than 2.5 m and lower than landing of the next floor. The floor space of upper terminal and lower terminal may be different, so the installation position of the upper and lower terminal can be different. If the floor space for the bottom floor is high, the installation distance of the lower terminal is equal to S1, if the floor space for the top floor is low, the installation can be carried out on the one point in the landing on the next floor. If the floor space for top and bottom floor are low, two terminals (FU24=ON：hypo terminal input can be used when the elevator speed is lower than 2.0 m/s) can be installed in order to get an exact changing point for the high speed curls, under this circumstance, the terminal can be installed on one point before the hypo landing, the installation position of the hypo terminal is S1.

2.0～4 m/s：If the floor space is big enough, the terminal installation distance shall be equal to S2. If not, the terminal station installation distance shall be larger than 2.5 m and less than the landing of the hypo highest floor. If the floor spaces for upper and lower terminals are different, the installation positions of upper and lower terminal can be different. If the floor space for bottom floor is big, the installation distance of lower terminal shall be equal to S2. If the distance between the two highest floors is higher than S2, the installation distance of the upper terminal is equal to S2, if it is smaller than S2, the installation can be carried out in the landing on the hypo highest floor. The installation positions of the upper and lower terminal are equal to S1, if this position is the same as the landing position of one floor, please install it in a long distance to avoid the superposition with the landing, the installation position is a litter bit bigger than S1.

### 4.3.4. Grounding of the control system

In the system installation process, please guarantee the system and the grounding terminals of every part grounded properly.

**1.** Grounding the shielded wire of rotary encoder；

**2.** Grounding wire of hoistway wire and traveling cable；

**3.** Grounding control cabinet case, grounding terminal of the inverter, the motor case and the car.

**4.** Grounding the grounding terminals of other parts；

**5.** Pay attention to distinguish the common, power grounding and external grounding.

# Chapter 5 Parameter Setup of BL3000 Serial Control System

## 5.1. General

LCD and keyboard are good man-machine communication interface which is set on main board BL2000-STB to debug, maintain and monitor the system. Operator can set the running parameter of the control system and inspect the running state and main input/output signal by LCD and keyboard during adjustment, maintenance and monitoring.

### 1. Introduction of LCD and keyboard

6 buttons are equipped at the bottom of LCD. The alignment and definition are as followed:
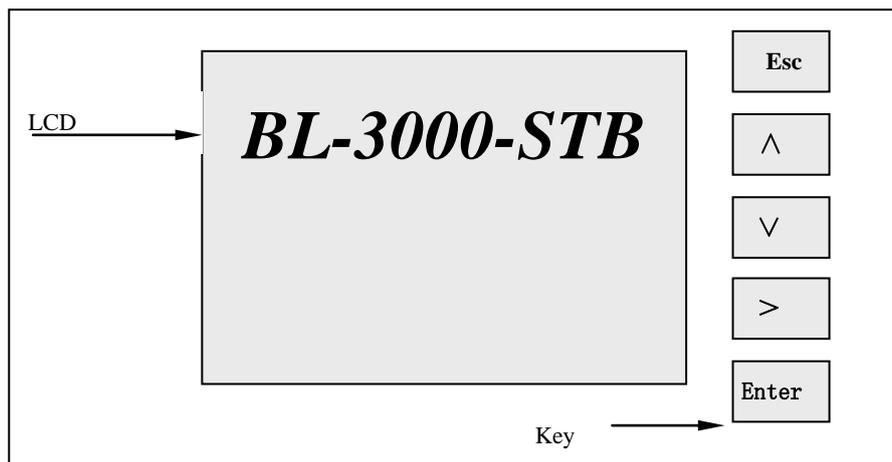


**Diagram 5-1-1 Layout of LCD and key**

**Enter**    Enter key: enter into next menu, confirm changing parameter and instruction register
**Esc**       Esc key: cancel and return to the previous menu.
**＞**          Cursor key: Circle move right; system enters into communication state by clicking it in main menu.
**∧**           Page up, increase 1 or select Yes (ON) key.
**∨**           Page down, decrease 1 or select No (OFF) key.

### 2. Parameters that can be set and monitored

（1）Parameter setup: general parameter, running parameter and special parameter.
（2）Monitor elevator state: automation, inspection, attendant, fire control and lock etc.
（3）Data monitor: hoistway position, elevator speed, I/O port, fault information, load, landing call, car call and communication etc.
（4）Hoistway selflearning.
（5）Set new password.

## 5.2. Menu structure and flowchart

Main flow chart



**Diagram 5-2-1Main flowchart**
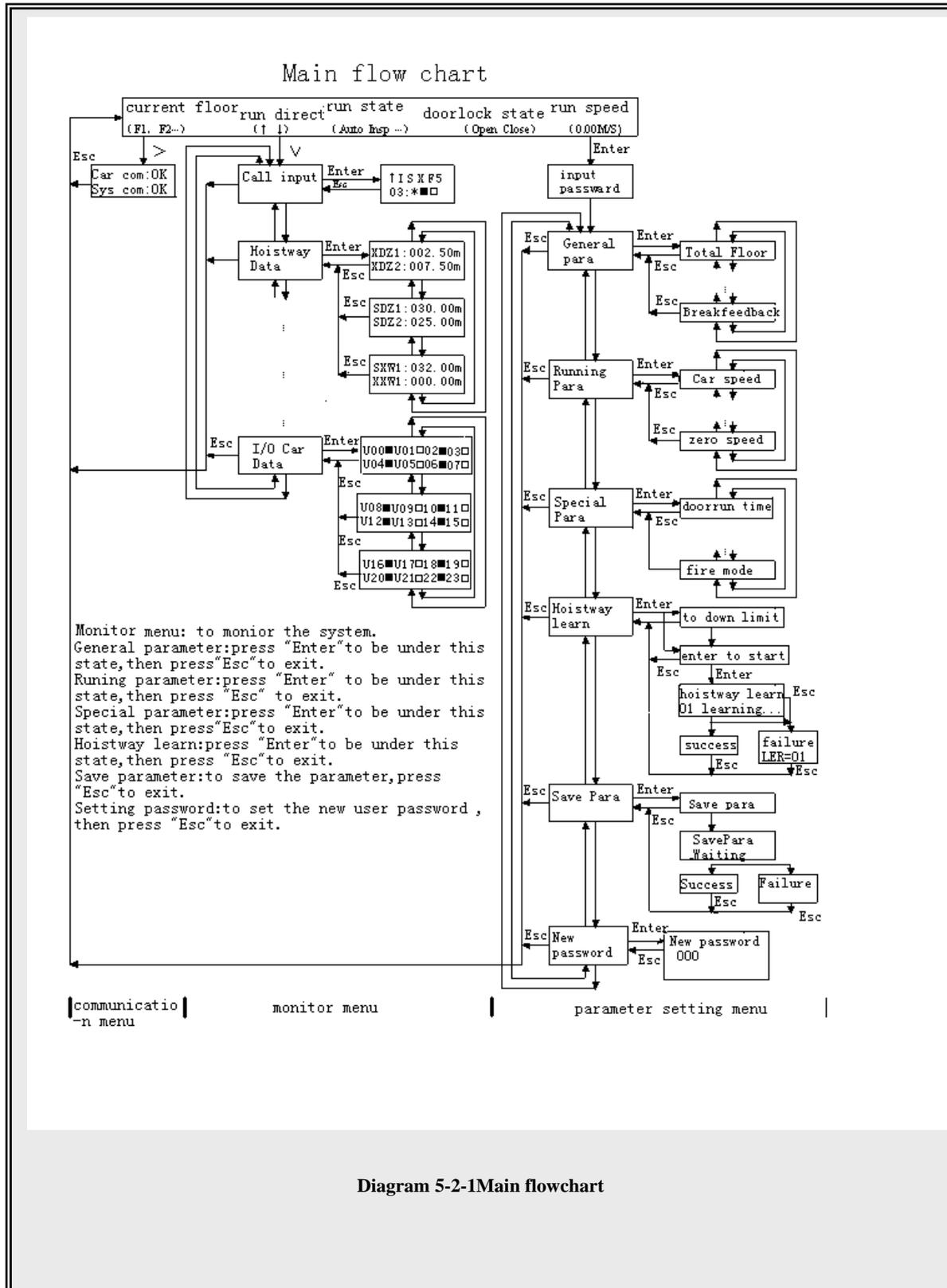
### 5.2.1. Main menu

It displays current floor, running direction, running state, fault state, door lock state and running speed

Fault state

↓

Elevator state →
Running direction →

| INSP   ER=10   CLOSE |
| ↓          1      0.00 m/s |

Door lock state
Running speed

↑

Current floor
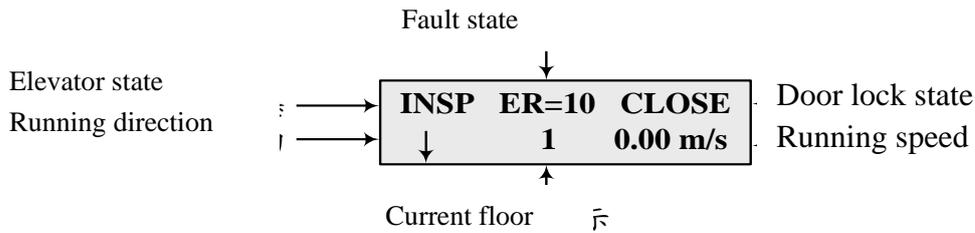
**1.** Elevator state:

|  |  |
|---|---|
| **INSP** | inspection |
| **MANU** | attendant |
| **AUTO** | automatic |
| **FIRE** | fire control |
| **STOP** | stop |
| **USER** | special use |

**2.** Fault state:

|  |  |
|---|---|
| **ER=#** | fault |
| **Blank** | no fault |

**3.** Door lock state:

|  |  |
|---|---|
| **CLOSE** | door close |
| **OPEN** | door open |

**4.** Press Menu key to return main menu unconditionally except in the state of hoistway selflearning, load inspection self learn and parameter saving.

## 5.2.2. Communication menu

System enters into communication state by pressing  >  in main menu.

COB Communication indicator

↓

| Car com:   OK   ER | ← Parallel communication indicator 1 |
| Sys com:   OK   OK | ← Parallel communication indicator |

↑

Normal communication indicator
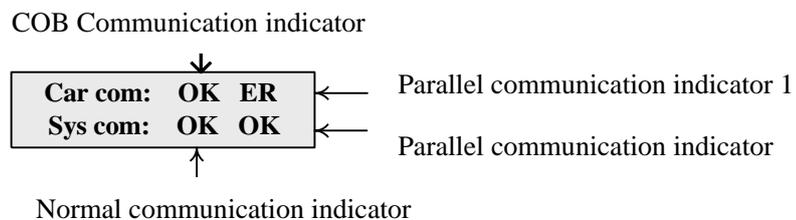
**1.** Car computer board communication display:

    **OK**    communication is normal.

    **ER**    main board receives error (check communication wire and car computer board), (check wire and COP), if there is error, it will display the number of errors.

**2.** System communication display

    **OK**    communication is normal

    **ET**    main board transfer error (check call communication wire), if there is error, it will display the number of errors.

**3.** Parallel communication indication

    **OK**    broadcast data communication of two parallel systems is normal

    **ET/ER**    broadcast data communication of two parallel systems is error (select)

**4.** Parallel communication indication 1

If no ER displayed, the no landing data communication of two parallel systems is normal; if ER displayed,

the new and old versions of the program are incompatible and parallel operation is unachievable when one elevator has bypassed stop.

### 5.2.3. Password check

Before you enter user menu and factory menu, set and save parameters, you must make the elevator in Inspection State and enter right password before accessing to relevant menu and set and save parameters. User password may be modified in Password Setting menu, while factory menu can not be modified because it is set before the elevator is delivered. For details about operations, refer to the following content.

### 5.2.4. Monitor menu and parameter setting menu

Monitor menu, general parameter menu, running parameter menu and special parameter menu are the basic interfaces for setting parameters and monitoring running state. In this system, the contents of supervision and parameters to be set are listed into User Menu and Factory Menu according to different requirements.

**1. User menu**

| Monitor menu | General Parameter | Running parameter | Special parameter |
|---|---|---|---|
| 选层信息<br>Call Input | 总层站数<br>Total Floor | 电梯额定速度<br>Car Speed | 门继电器保持时间<br>Door Run Time |
| 井道(开关)位置<br>Hoistway Data | 待梯楼层<br>Homing Floor | 电机额定转速<br>Motor Speed | Factory menu |
| 层站信息<br>Floor Data | 时间设置<br>Set Time | 编码器脉冲数<br>Pulses | |
| 输入输出值<br>I/O State | (自动)开门保持时间<br>Open Door Time | 检修运行速度<br>Insp Speed | |
| 速度反馈(值)<br>Speed Feedback | 开门延长时间<br>Open Delay Time | 起动(平滑)速度<br>Start Speed | |
| 称重状态<br>Loading Data | 返基站时间<br>Homing Time | 爬行运行速度<br>Leveling speed | |
| 运行报告<br>Run Report | (自动)开梯时间<br>Start Time | 单层运行速度<br>Least Speed | |
| 故障记录<br>Fault Report | (自动)关梯时间<br>Stop Time | 提前开闸时间<br>Break On Time | |
| 呼梯(通信)讯测试<br>Call Test | 称重设置<br>Load Setting | 抱闸时间<br>Break Off Time | |
| (电磁)干扰评价<br>Interfer Apprais | Factory menu | Factory menu | |
| 编码器评价<br>Encoder Apprais | | | |
| 输入信号评价<br>Input Apprais | | | |
| 软件序号<br>Software No | | | |
| Factory menu | | | |

**Diagram 5-2-4-1 User menu flowchart**

## 2. Factory menu

| Monitor menu | General parameter | Running parameter | Special parameter |
|---|---|---|---|
| User menu | User menu | User menu | User menu |
| 输入信号<br>I/O Input | 消防层<br>Fire Floor | 加速斜率 b1<br>Acceleration b1 | 恢复出厂值<br>Factory Para |
| 输出信号<br>I/O Output | 锁梯层<br>Parking Floor | 减速斜率 b2<br>Deceleration b2 | 并联使能<br>Twins Control |
| 轿厢信号<br>I/O Car Data | 输入类型<br>Input Type | S 曲线 P1<br>S Curve p1 | 群控使能<br>Group Control |
| 开/关门输入<br>Open Close Door | 轿厢信号类型<br>Car Input Type | S 曲线 P2<br>S Curve p2 | 远程监控<br>Far Monitor |
| | 输出类型<br>Output Type | S 曲线 P3<br>S Curve p3 | 贯通门方式<br>Two Door Mode |
| | 显示设置<br>Set Indication | S 曲线 P4<br>S Curve p4 | 消防方式<br>Fire Mode |
| | 设置停靠层<br>Set Stop Floor | 零速设置<br>Zero Speed | 并联梯号<br>Parallel No |
| | 开门延长使能<br>Open Delay Able | 零速时间<br>Zero Time | 多段速度方式<br>Multi Speed Mode |
| 使能延时时间<br>Enable delay time | 称重输出电压<br>Load Give | 运行信号等待时间<br>Run Input time | 多段速度设置<br>Multi Speed Give |
| 到站信号延时时间<br>Beep delay time | 抱闸反馈检测使能<br>Break Feedback | 起动平滑时间<br>Star speed time | 换速距离<br>Decel Distance |
| 关照明延时时间<br>Lamp off time | 贯通门动作选择<br>Door select | 平层调整<br>Leveling Adj | 运行超时时间设置<br>Over Time |
| 再平层运行速度<br>Lelevelrun speed | 输入功能选择<br>Input select | 负载补偿调整<br>Load Adj | 语言选择<br>Language set |
| 再平层停止速度<br>Lelevelst speed | 输出功能选择<br>Output select | 提前开门速度<br>Open door speed | 特殊功能选择<br>Function select |

**Diagram 5-2-4-2 Factory menu flowchart**

### 5.2.5. Notice of menu setup

**1.** User menu is accessible to all users (it can be accessed after the password is verified to be correct).

**2.** Factory menu is accessible to the users who have factory password.

**3.** When Enter is displayed on bottom right corner on LCD, you may press Enter key enter into corresponding sub-interfaces.

**4.** When entering the interface of parameter setting, if there is no cursor, you can not set parameter. When you press Enter key and cursor is displayed, then you can modify parameter by "∧" and "∨", move right the cursor by "＞"..

**5.** Definitions of terms:

1. Floor: the displayed floor

2. Absolute floor: bottom floor is 1, the 2nd floor is 2, and the 3rd floor is 3 and so on.

## 5.3. Setup and operation of monitor parameter menu

### 5.3.1. Monitor parameter list

In the monitor menu, all the parameters are read-only except the call input and open/close door command, for input operation is available.

**Table 5-3-1 Monitor parameter**

| No | Chinese | English | Instruction |
|---|---|---|---|
| | | **User menu** | |
| 1 | 选层信息 | Call Input | displays car call, landing call and inter select |
| 2 | 井道开关位置 | Hoistway switch position | displays top/bottom limit and terminal |
| 3 | 层站信息 | Landing Data | Leveling position for all floors and stopping or not |
| 4 | I/O 口组合值 | I/O combination value | I/O state corresponding to decimal |
| 5 | 速度反馈值 | Speed feedback value | Current motor speed (rpm) and elevator speed (m/s) |
| 6 | 负载检测状态 | Loading Data | Current load percentage    (load device is valid) |
| 7 | 运行报告 | Run Report | Accumulated running time |
| 8 | 故障记录 | Fault Report | The latest 10 faults records |
| 9 | 外召通讯测试 | Call Test | Test communication between call board and main board |
| 10 | 电磁干扰评价 | Interfere Appraise | Valuate EMI (grounding condition) |
| 11 | 编码器评价 | Encoder Appraise | Valuate coder interference |
| 12 | 输入信号评价 | Input Appraise | Display input interference and inter state before the latest 10 shutdowns |
| 13 | 软件序号 | Software    No | Software version No. |
| | | **Factory menu** | |
| 14 | 输入信号（点对点显示） | I/O Input | Input port state |
| 15 | 输出信号（点对 | I/O    Output | Output port state |

| | | | |
|---|---|---|---|
| | 点显示) | | |
| 16 | 轿厢信号 | I/O Car Data | COP input/output state |
| 17 | 开/关门输入命令 | Open Close Door | Close/open door command with keyboard |

**5.3.2. Setup and operation**

**1. Call floor information**

It display car call and up and down landing call, car call may select via menu operation (for commissioning).

（**1**）Press "∨" key under main menu to enter the first page of monitor menu, the main interface for floor selection information:

```
Call Input Enter
     选层输入
```

（**2**）Press Enter key to enter select floor:

Running direction
Selected floor

```
  ▼  I  S  X  F5      ←← Current floor
  03 *  ■  □
```

Car call
Up landing call
Down landing call
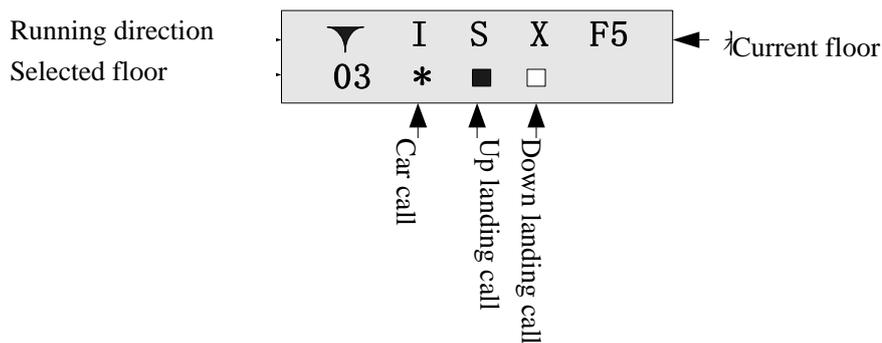
（**3**）You may select observation floor by pressing "∧" and "∨" in call information interface. "∧" and "∨" are current running direction. "*" flashing indicates there is car call. Pressing Enter can select the car call (* flashing) for observation when commissioning, to realize quick commissioning. "□" represents no landing call, "■" represents up and down landing call. "F-XX" indicates the floor that the elevator is on currently. Press Esc to return to the main interface for floor selection information.

**2. Hoistway switch position**

It displays the position of top/bottom limit switch and top/bottom terminal. It starts from bottom limit. The unit is meter.

（**4**）It will enter into the 2nd monitor item by click "∨" key from instruction menu (Select item by "∧" and "∨" key, the following in accordance with this).

```
Hoistway Data  Enter
      井道数据
```

（**5**）Press **Enter** to hoistway switch position interface:

```
Up terminal station 1   ───→   XDZ1: 030.00 m
Up terminal station 2   ───→   XDZ2: 025.00 m

Down terminal station 1 ───→   XDZ1: 002.50 m
Down terminal station 2 ───→   XDZ2: 007.50 m

Up limit station 1      ───→   XDZ1: 032.00 m
Down limit station 2    ───→   XDZ2: 000.00 m
```
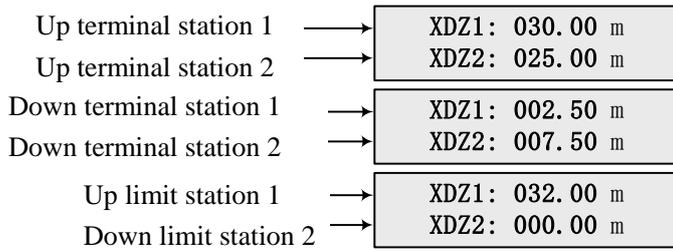
（**6**）Press ∧ and ∨ keys to change the observation item in hoistway switch position interface. Press Esc to return.

## 3. Landing information

The 1st line on the interface shows whether the landing is the stopping at the floor (□: not stop; ■: stop).
The 2nd line shows the scale value of the leveling position at all floors, with down position limit as the starting point.

```
                    ┌──────────────────────────┐
                    │   Floor  Data    Enter    │
                    ├──────────────────────────┤
                    │        层站数据           │
                    └──────────────────────────┘

Observed floor  楼层        Enter

     Esc          ┌──────────────────────────┐
                  │    2:  Stop   ■           │  Stop information
                  │  Data:  010.00m           │  Position of observed floor
                  └──────────────────────────┘
```
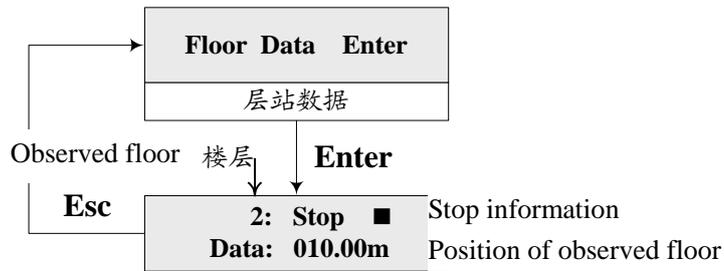
## 4. I/O combination display

The data are decimals, which represent the I/O port state by corresponding binary.

```
                    ┌──────────────────────────┐
                    │   I/O State     Enter     │
                    ├──────────────────────────┤
                    │      输入/输出口          │
                    └──────────────────────────┘

                              Enter

      Esc         ┌──────────────────────────┐
                  │   I N  :   00000322       │
                  │   OUT:    00000322        │
                  └──────────────────────────┘
```
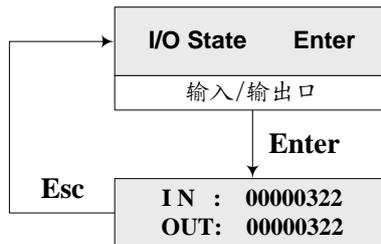
For example: decimal: IN = 00000322, OUT=00000322

Binary: IN = 101000010, OUT=101000010

| X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | X10 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | X11 |  |  |  |  |  |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

| X12 | X13 | X14 | X15 | X16 | X17 | X18 | X19 | X20 | X21 | X22 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | X23 |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Y11 |  |  |  |  |  |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

| Y12 | Y13 | Y14 | Y15 | Y16 |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |

## 5. Speed feedback value

It displays the given and feedback speed curves of the elevator. If pressing Enter, current speed curve can be locked. (At the same time, if pressing the right button, it can be switched to the display of elevator speed feedback and motor speed);

**Speed Feedback  Enter**

速度反馈

**Enter**

0.30m/s   0200rpm
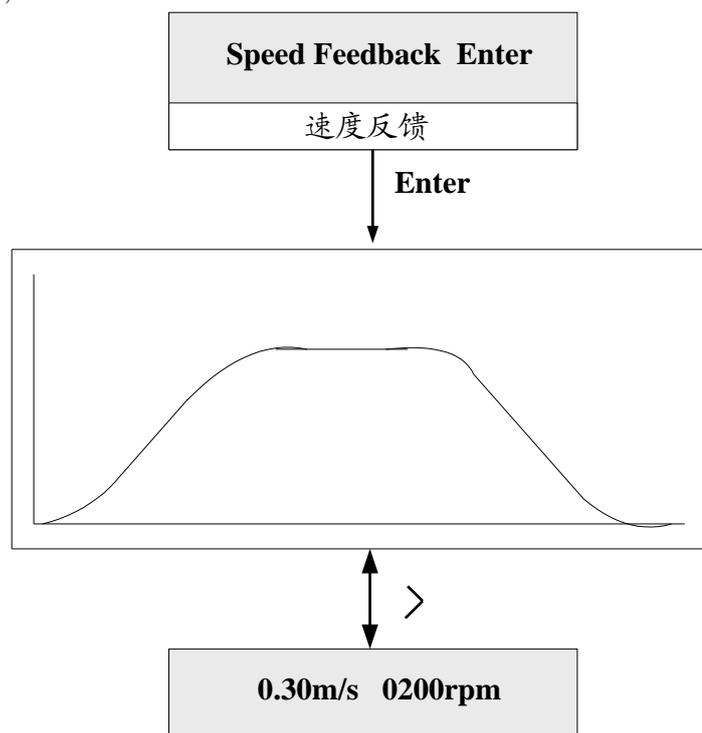
## 6. Load data

Load enable must be set to "Yes" if you want to enter into this menu. Light load: 0%; half load: 50% and full load: 100%.

```
            ┌──────────────────────────┐
            │   Loading  Data  Enter   │
            ├──────────────────────────┤
            │         ? ? ? ?          │
            └──────────────────────────┘
                         │ Enter
                         ▼
            ┌──────────────────────────┐
   Esc      │    Loading  Data         │
            │         80%              │
            └──────────────────────────┘
```
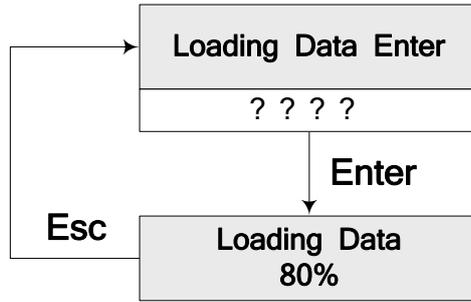
## 7. Running record

Accumulated running time and times.

```
            ┌──────────────────────────┐
            │    Run Report Enter      │
            ├──────────────────────────┤
            │        运行记录           │
            └──────────────────────────┘
                         │ Enter
                         ▼
            ┌──────────────────────────┐
   Esc      │    00000000H             │  Running hours
            │    0000000               │  Running times
            └──────────────────────────┘
```
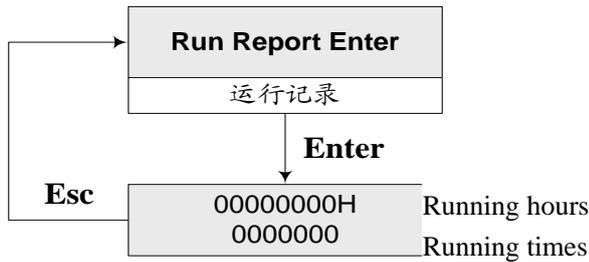
## 8. Fault record

It records type and time of the latest 20 faults, which is selected by '∧' and '∨.

```
            ┌──────────────────────────┐
            │    Fault Report  Enter   │
            ├──────────────────────────┤
            │        故障记录           │
            └──────────────────────────┘
  No.  Code  代码    │ Enter
            ↓    ↓   ▼
   Esc    ┌──────────────────────────┐
          │ 01：    ER=02     F03    │ ← Fault floor
          │ 02-10-10  12:12          │ ← Fault time
          └──────────────────────────┘
```
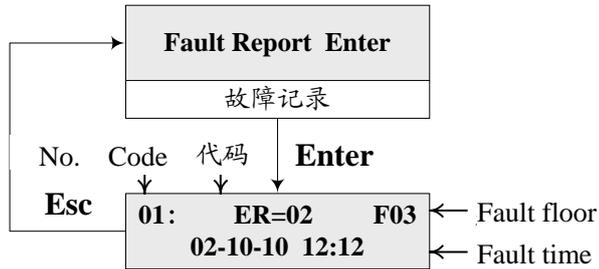
## 9. Landing call communication test

It checks communication among call and display board and main board.
◆ The number of landing call is selected by "∧" and "∨".
◆ OK: normally communicate; Wait: testing (If the time of displaying Wait is too long, check communication system); Fail: fail to communicate (check call and display board of the floor).

```
            ┌──────────────────────────┐
            │    Call Test  Enter      │
            ├──────────────────────────┤
            │        外召测试           │
            └──────────────────────────┘
                         │ Enter
                         ▼
   Esc     ┌──────────────────────────┐
           │    Call   Test           │
           │    01：   OK             │
           └──────────────────────────┘
                  ↑        ↑
   Actual floor of landing call   Communication:  OK,WAIT,FAIL
```
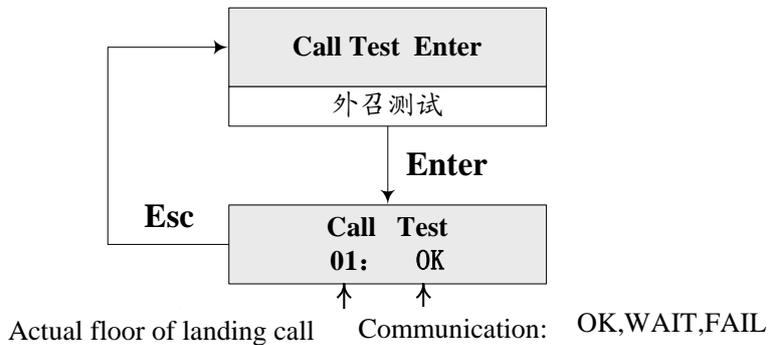
## 10. EMI Appraisis

When elevator is debugged and running normally, EMI may be appraised in this interface when elevator is running.

```
┌──────────────────────────┐
│  Interfere Apprais   Enter │
├──────────────────────────┤
│         干扰评价           │
└──────────────────────────┘
            │ Enter
            ▼
┌──────────────────────────┐
│      InterferApprais      │
│           050             │
└──────────────────────────┘
  Esc
```
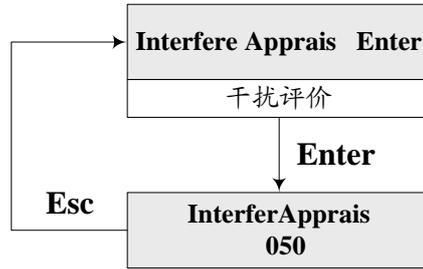
The value represents the intensity of EMI, "000" represents system is well earthed.

## 11. Coder evaluation

When elevator speed is steady, the higher the values are, the worse the quality of coder signal is.

```
┌──────────────────────────┐
│  Encoder Apprais   Enter  │
├──────────────────────────┤
│         编码器评价         │
└──────────────────────────┘
            │ Enter
            ▼
┌──────────────────────────┐
│      Encoder Apprais      │
│           050             │
└──────────────────────────┘
  Esc
```
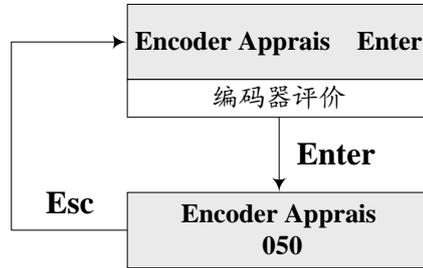
## 12. Input signal elevation

Observe input port interference.

```
┌──────────────────────────┐
│   Input Apprais  Enter    │
├──────────────────────────┤
│        输入信号评价         │
└──────────────────────────┘
            │ Enter
            ▼
┌──────────────────────────┐
│  01:      00000000234     │  ← State before stopping 10 times
│  X01:- - - -_ _ _ _ _ _ □ │
└──────────────────────────┘
  Esc
   Input port  Bar chart    Input state
```
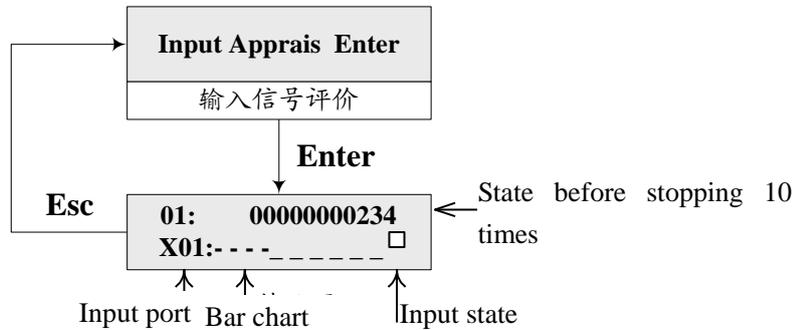
The heights of bars represent input port logic levels. High: 1, low: 0. if the quantity of 1 of input port in the bar chart is closer to that of 0, the interference is more intense.

## 13. Software version number

Software number when the system is delivered.

```
        ┌──────────────────────┐
   ┌───►│  Software  No  Enter │
   │    ├──────────────────────┤
   │    │       软件版本号       │
   │    └──────────────────────┘
   │              │ Enter
   │              ▼
   │    ┌──────────────────────┐
 Esc    │    Software  No       │
   └────│        159           │
        └──────────────────────┘
```

### 14. Input signal (point-to-point display)

```
        ┌──────────────────────┐
   ┌───►│   I/O Input   Enter  │
   │    ├──────────────────────┤
   │    │       输入信号        │
   │    └──────────────────────┘
   │              │ Enter
   │              ▼
   │    ┌──────────────────────────────┐
   │    │ X00■ X01□ X02■ X03□          │
   │    │ X04■ X05□ X06■ X07□          │
   │    ├──────────────────────────────┤
   │    │ X08■ X09□ X10■ X11□          │
   │    │ X12■ X13□ X14■ X15□          │
   │    ├──────────────────────────────┤
   │    │ X16■ X17□ X18■ X19□          │
 Esc    │ X20■ X21□ X22■ X23□          │
   └────┴──────────────────────────────┘
```
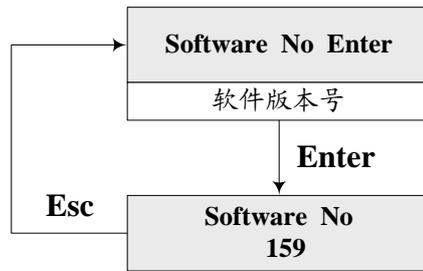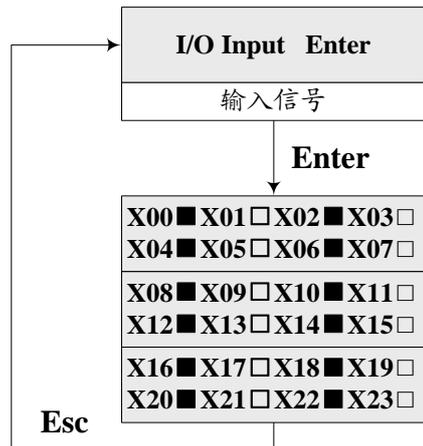
■: input 1; □: input 0.   (□: light off, ■: light on)

### 15. Output signal (point-to-point display)

```
        ┌──────────────────────┐
   ┌───►│  I/O  Output   Enter │
   │    ├──────────────────────┤
   │    │       输出信号        │
   │    └──────────────────────┘
   │              │ Enter
   │              ▼
   │    ┌──────────────────────────────┐
   │    │ Y00■ Y01□ Y02■ Y03□          │
   │    │ Y04■ Y05□ Y06■ Y07□          │
   │    ├──────────────────────────────┤
   │    │ Y08■ Y09□ Y10■ Y11□          │
   │    │ Y12■ Y13□ Y14■ Y15□          │
   │    ├──────────────────────────────┤
   │    │ Y16■ Y17□ Y18■ Y19□          │
 Esc    │ Y20■ Y21□ Y22■ Y23□          │
   └────┴──────────────────────────────┘
```
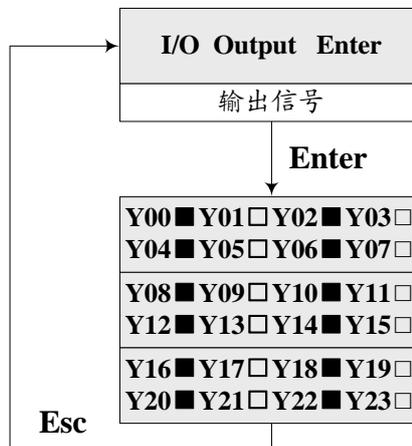
■: Output is 1 (output relay is powered on); □: output is 0;

### 16. Car signal

Note: Car signal displaying ■, means the signal is valid, while □ means the signal is invalid (has been transformed through car signal input level setting in general parameters); Different from the main board display of Item 14, which displays the state of input and being valid or not can be known only after transformation through input type setting.

```
            ┌─────────────────────────────┐
       ┌───▶│   I/O  Car Data Enter       │
       │    ├─────────────────────────────┤
       │    │    轿箱输入/输出信号          │
       │    └─────────────────────────────┘
       │                  │ Enter
       │                  ▼
       │    ┌─────────────────────────────┐
       │    │ U00■ U01□ U02■ U03□          │
       │    │ U04■ U05□ U06■ U07□          │
       │    │ U08■ U09□ U10■ U11□          │
       │    │ U12■ U13□ U14■ U15□          │
       │    │ U16■ U17□ U18■ U19□          │
       │    │ U20■ U21□ U22■ U23□          │
       │    └─────────────────────────────┘
       └──── Esc
```
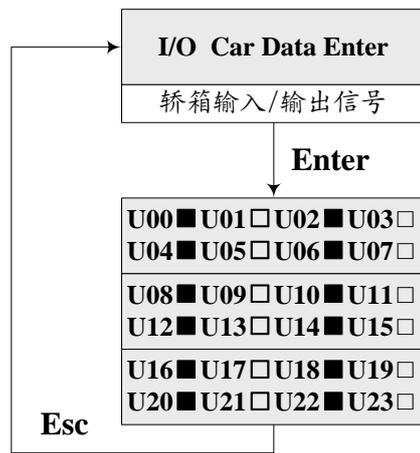
**Table 5-3-2 (13) Car signal**

| No. | Definition | No. | Definition | No. | Definition |
|-----|-----------|-----|-----------|-----|-----------|
| U00 | Close door button 1 | U07 | Open door limit 1 | U14 | Light load switch |
| U01 | Open door button 1 | U08 | Special switch | U15 | Over load switch |
| U02 | Open door button 2 | U09 | Open door delay switch | U16 | Idling   (standby) |
| U03 | Close door button 2 | U10 | Attendant switch | U17 | Safe board switch 2   (two door mode) |
| U04 | Close door limit 2 | U11 | Standby | U18 | Safe board switch 1 |
| U05 | Open door limit 2 | U12 | Passby switch | U19-U23 | Standby |
| U06 | Close door limit 1 | U13 | Full load switch | | |

**17**. Open/close door input

```
            ┌─────────────────────────────┐
       ┌───▶│  Open  Close  Door  Enter    │
       │    ├─────────────────────────────┤
       │    │        开/关门输入            │
       │    └─────────────────────────────┘
       │                  │ Enter
       │                  ▼
       │    ┌─────────────────────────────┐
       │    │   Open  Close  Door          │
       │    │   Open□     Close■           │
  Esc  │    ├─────────────────────────────┤
       └────│   开门      关门             │
            └─────────────────────────────┘
```
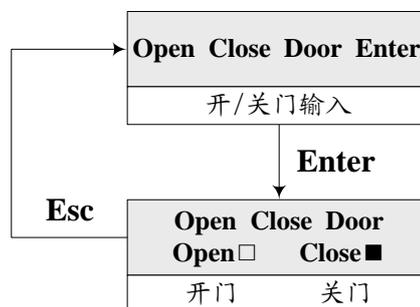
Press ∧ or ∨ to open/close door. ■: close door input is valid. You may also input Open Door command in same way. With this interface, you door open/close operation can be done in machine room.

## 5.4. General parameters menu setting and operation

### 5.4.1. General parameters list

Please refer to **Table 5-4-1 General Parameters.**

### 5.4.2. Setting and operation

**1. Initial steps**

When setting the parameters related to the elevators, enter the correct password (user password/factory password). Press OK under the state of maintenance.

| Input Password Enter |
|:---:|
| 输入密码 |

（**1**）After the interface for inputting password appears, the position for setting password will blink, press ∧ or ∨ key for increasing or decreasing the number. If the password is correct, press **Enter** key to display the general parameters menu**,** or the followings will be displayed**:**

| Password Error Enter |
|:---:|
| 密码错误 |

（**2**）Press **Enter** key to enter password again till the password is correct and then press **Enter** key to enter General Parameter interface.

| General Para Enter |
|:---:|
| 基本参数 |

（**3**）Press **Enter** key to enter general parameters setting.

**Table 5-4-1 General parameters**

| Serial No. | Chinese | English | Factory Parameters | Range | Description |
|:---:|:---:|:---:|:---:|:---:|:---|
| | | | | | **User menu** |
| 1 | 总层站数 | Total Landings | —— | 1-64 | The total floor number(which is equal to bridge plate number within the door zone in the hoistway) |
| 2 | 待梯层 | Homing Floor | 1* | 1-total landings | The floor where elevator timely returns when there is no car selection. |
| 3 | 系统时间 | System Time | —— | | To display and set the system time |
| 4 | 自动开门保持时间 | Open Door Time | 3s* | 0-999s | Open door time for an elevator under the automatic state |
| 5 | 开门延长时间 | Open Delay Time | 30s* | 0-999s | Open door time for an elevator under the automatic state (this parameter is available only when the open delay able is set **Yes.**). |
| 6 | 返待梯层时间 | Homing Time | 60s* | 0-999s | Homing time of an elevator when there |

| | | | | | is no hall call or car selection |
|---|---|---|---|---|---|
| 7 | 自动开梯时间 | Auto-start Time | 00：00* | | The elevator will start according to the set time. (Electric lock **ON**). |
| 8 | 自动关梯时间 | Auto-stop Time | 00：00* | | The elevator will stop according to the set time (electrical lock **ON**). |
| 9 | 负载检测设置 | Load Inspection Setting | NO | | Set the load inspection YES/NO (it is only applicable to SJT-150 device) |
| **Factory Menu** | | | | | |
| 10 | 消防层 | Fire Floor | 1* | | Return floor for fire initial state |
| 11 | 锁梯层 | Parking Floor | 1* | | Return floor for electrical lock turn-off |
| 12 | 输入接口有效电平设置 | Input Interface Effective Electrical Level Setting | ON | Any floor | Inputting low electrical level (**ON**) or high level (**OFF**) ▲Note：Signal settings for upper, lower limit positions, etc. |
| 13 | 轿厢信号输入电平 y 设置 | Car signal input level setting | | ON/OFF | Car signal input level setting |
| 14 | 输出继电器触点类型 | Type of Output Relay Contact | OFF | | The normally open point for output relay is set **OFF**, and the normally close point is set **ON.** |
| 15 | 层站显示设置 | Set Floor Indication | 00-64 | | Set the display character of a certain floor |
| 16 | 设置停靠层 | Set Stop Floor | ON | | Set if landing each floor is needed. (**ON** refers to landing， **OFF** refers to no landing) |
| 17 | 开门延长使能 | Open Delay Enable | NO* | | The function should be able to delay the door opening time. (optional) |
| 18 | 负载检测输出电压 | Load Inspection Output Voltage | 0-10 V | -10-+10v | The range of load inspection compensation output voltage |
| 19 | 抱闸反馈检测使能 | Brake Feedback Inspection Enable | Yes* | | Select **Yes**, system will inspect the brake feedback. Select **No**, system won't inspect it. |
| 20 | 贯通门动作选择 | Rear opening Action Selection | | | Door action selection of landing floor (Front door or rear door) . |
| 21 | 输入功能选择 | Input select | | 0-27 | Output function selection of output ports of X26-X29 |
| 22 | 输出功能选择 | Output select | | 0-19 | Output function selection of output ports of Y16 - Y19 |

## 1. Setting of total floor number

Set the total floor number of the elevator.

| **Total Floor  64** |
|---|
| 总楼层数 |

（**1**）Press **Enter** key**,** modify the total floor number when the number at the lower right corner flashes；

（**2**）After modification, press **Enter** key to finish；

（**3**）Press **Esc** key to cancel modification and restore to the original value；

（**4**）The total floor number should be equal to the bridge plate number within the door zone in the hoistway.

## 2. Setting of homing floor

The floor the elevator delays to return (returns to the home landing) when there is no hall call or car selection, the setting method is the same as the above.

| **Homing Floor  1** |
| :---: |
| 待梯楼层 |

## 3. Setting of system time

Set the system time (24-hour system) according to the following sequence: year — month — day—hour—minute.

| Set Time<br>00-00-00 00:00 |
| :---: |
| 时间设置 |

## 4. Setting of open door time

Set the open door time for an elevator under the automatic state. The actual open door time for an elevator can be adjusted according to the stop reasons. If the stop is only caused by an internal order or a hall call, keep this open door time. If the stop is caused by both an internal order and a hall call, add 2 seconds to this open door time.

| Open Door Time<br>000s |
| :---: |
| 开门保持时间 |

## 5. Setting of open delay time

Pressing the Open Delay Time Button (switch) under the automatic state can prolong the open delay time of the elevator. This function should be set and taken into effect only when the door open delay enable is **Yes.** The unit for the open delay time is second.

| Open Delay Time<br>000s |
| :---: |
| 开门延长时间 |

## 6. Setting of homing time

The automatic homing time；If it is set to 0, there is no homing function.

| Homing Time<br>000s |
| :---: |
| 返待梯层时间 |

## 7. Setting of automatic start time

System will start the elevator according to the set time. (electric lock **ON**) .

```
        ┌──────────────────────────────┐
        │      Start Time  Enter       │
        ├──────────────────────────────┤
        │          开梯时间             │
        └──────────────────────────────┘
                      │ Enter
                      ▼
  Esc   ┌──────────────────────────────┐
        │         Start Time           │
        │          07: 00              │
        └──────────────────────────────┘
```
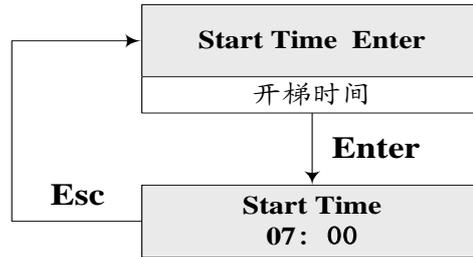
## 8. Setting of automatic stop time

The system will stop the elevator according to the set time (electrical lock **ON**) .
When the automatic start time is the same as the automatic stop time, the function is void.

```
        ┌──────────────────────────────┐
        │      Stop Time  Enter        │
        ├──────────────────────────────┤
        │          关梯时间             │
        └──────────────────────────────┘
                      │ Enter
                      ▼
  Esc   ┌──────────────────────────────┐
        │         Stop Time            │
        │          18: 00              │
        └──────────────────────────────┘
```
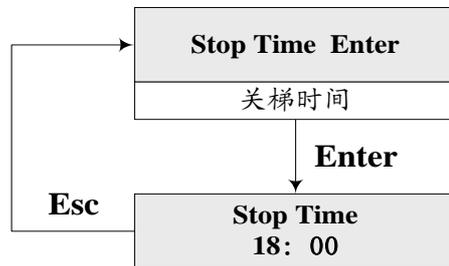
## 9. Setting of load inspection (this function is only applicable to the SJT-150 load inspection device)

When the load compensation is needed by the inverter control, load inspection self-learning has to be carried out if the correct load compensation output is needed. The method for self-learning is as follows:

```
        ┌──────────────────────────────┐
        │      Load Seting  Enter      │
        ├──────────────────────────────┤
        │        称重装置设置           │
        └──────────────────────────────┘
                      │ Enter
      Esc             ▼
        ┌──────────────────────────────┐
        │      Load Select  Yes?       │
        ├──────────────────────────────┤
        │         有否称重?             │
        └──────────────────────────────┘
                      │
      Esc             ▼
        ┌──────────────────────────────┐
        │      Light Loaded Enter      │
        ├──────────────────────────────┤
        │          空载学习             │
        └──────────────────────────────┘
                      │
      Esc             ▼
        ┌──────────────────────────────┐
        │      Full Loaded Enter       │
        ├──────────────────────────────┤
        │          满载学习             │
        └──────────────────────────────┘
```
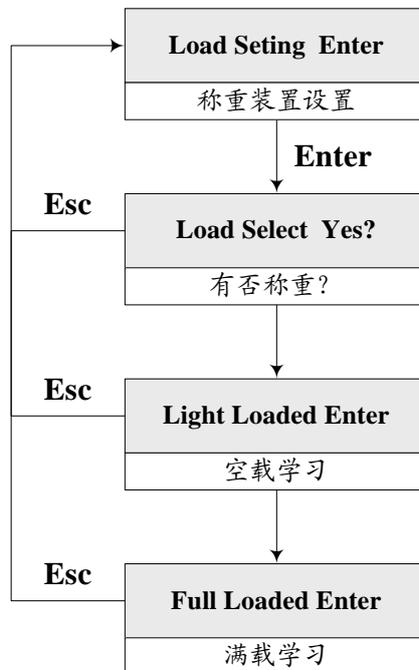
（1）Enter the load inspection **Yes/No** interface and then press **Enter** key, **Yes** or **No** will blink, press ∧ or ∨ key to select. Press **Enter** key after selection, or press **Esc** to cancel the selection. The light loaded or full loaded self-learning should be carried out only after selecting **Yes** and then pressing ∨ key**.**

（2）Light loaded self-learning：Make the car light loaded and press **OK** key.

```
        ┌──────────────────────┐
   ┌───→│  Light Loaded Enter  │
   │    ├──────────────────────┤
   │    │        空载学习        │
   │    └──────────────────────┘
   │                │ Enter
Esc│                ↓
   │    ┌──────────────────────┐
   ├────│     Light Loaded     │
   │    │      Learning...     │
   │    ├──────────────────────┤
   │    │         学习中         │
   │    └──────────────────────┘
   │                │
Esc│                ↓
   │    ┌──────────────────────┐
   └────│     Light Loaded     │
        │    Success/Failure   │
        ├──────────────────────┤
        │       成功/失败        │
        └──────────────────────┘
```
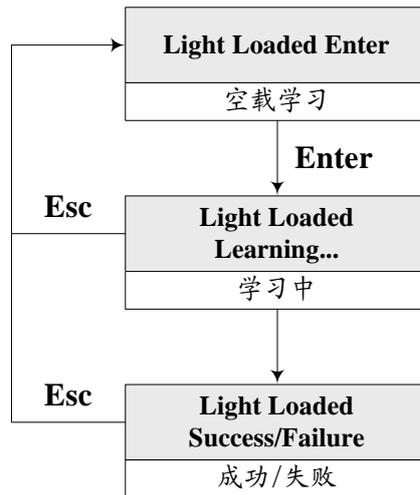
（**3**）Full loaded self learning：Make the car full loaded and press **OK** key.

```
        ┌──────────────────────┐
   ┌───→│   Full Loaded Enter  │
   │    ├──────────────────────┤
   │    │        满载学习        │
   │    └──────────────────────┘
   │                │ Enter
Esc│                ↓
   │    ┌──────────────────────┐
   ├────│     Full Loaded      │
   │    │      Learning...     │
   │    ├──────────────────────┤
   │    │         学习中         │
   │    └──────────────────────┘
   │                │
Esc│                ↓
   │    ┌──────────────────────┐
   └────│     Full Loaded      │
        │    Success/Failure   │
        ├──────────────────────┤
        │       成功/失败        │
        └──────────────────────┘
```
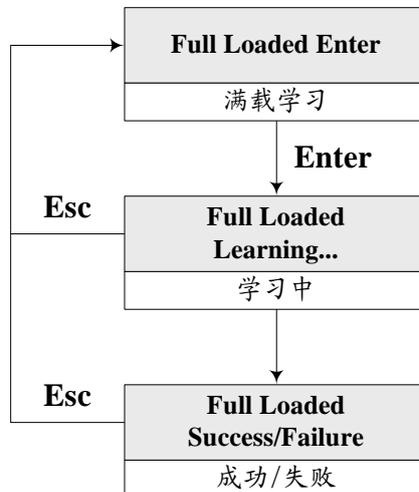
（**4**）During self-learning, displaying **Wait** means self-learning is going on and please wait, **Success** means self-learning is carried out successfully and **Failure** means self-learning fails.

（**5**）Notes

◆ Load inspection device is one of optional accessories in this system;

◆ It can produce light loaded, full loaded and overloaded alarm signal;

◆ It can output the analog load signal used for load compensation input of the inverter.

◆ After load inspection self-learning, set compensation voltage grade and range according to the requirements of the inverter.

◆ After load inspection self learning, if the current load condition is wondered, please check the load inspection status in the monitoring menu.

◆ If load inspection self learning fails, please check the load inspection device.

◆ Please refer to *Instruction of SJT-150* for details about load inspection device.

◆ When using the load inspection device manufactured by other companies through operation panel to input light loaded, full loaded and overloaded switch signals, please set Load select to be **No**, the system will directly confirm load switch signal input.

## 10. Setting of fire evacuation floor

After receiving the fire switch signal, the elevator will cancel car selection and hall call signals and direct run to the fire evacuation floor.

```
Fire Floor 01
消防层设置
```

## 11. Setting of parking floor

Turn off the electrical lock during the normal running of the elevator, the elevator runs to the parking floor and stop.

```
Parking Floor 01
锁梯层设置
```

## 12. Setting of effective electrical level at the input port

```
          Input Type Enter
          输入有效电平
             │ Enter
             ▼
Esc       Input Type
          X00: On
          闭合有效
             │
             ▼
Esc       Input Type
          X01: Off
          断开有效
```
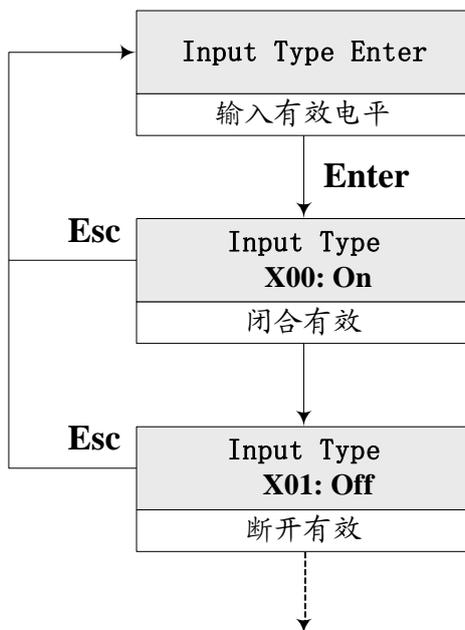
**Table 5-4-2-Setting of effective electrical level at the input port**

| Name | Port No. | Location | Definition | Corresponding parameter | Default settings for input electrical level | External switch status | Normal status of the indicators |
|------|----------|----------|------------|-------------------------|---------------------------------------------|------------------------|--------------------------------|
| **Main Control Board** | X1 | J1-2 | Upward Input | X1 | ON | Normally ON | OFF |
| | X2 | J1-3 | Downward Input | X2 | ON | Normally ON | OFF |
| | X3 | J1-4 | Upper Station 2 Input | X3 | OFF | Normally OFF | ON |
| | X4 | J1-5 | Lower Station 2 Input | X4 | OFF | Normally OFF | ON |
| | X5 | J1-6 | ▲Upper Limit Position Input | X5 | ON | Normally OFF | ON |
| | X6 | J1-7 | ▲Lower Limit Position Input | X6 | ON | Normally OFF | ON |

| | X7 | J1-8 | Upper Station 1 Input | X7 | OFF | Normally OFF | ON |
|---|---|---|---|---|---|---|---|
| | X8 | J1-9 | Lower Station 1 Input | X8 | OFF | Normally OFF | ON |
| | X9 | J1-10 | Upper Leveling Input | X9 | ON | Normally ON | OFF |
| | X10 | J2-1 | Lower Leveling Input | X10 | ON | Normally ON | OFF |
| | X11 | J2-2 | Frequency Inverter Fault Input | X11 | ON | Normally ON | OFF |
| | X12 | J2-3 | Fire Input | X12 | ON | Normally ON | OFF |
| | X13 | J2-4 | Emergency Stop Input | X13 | ON | Normally ON | OFF |
| | X14 | J2-5 | Door Interlock Input | X14 | ON | Normally ON | OFF |
| | X15 | J2-6 | *Brake Feedback Input /Main Power Supply Connector Input | X15 | ON | Normally ON | OFF |
| | X16 | J2-7 | Auxiliary Connector Input | X16 | ON | Normally ON | OFF |
| | X17 | J2-8 | Brake Connector Feedback Input | X17 | ON | Normally ON | OFF |
| | X18 | J2-9 | Emergency Automatic leveling Input | X18 | ON | Normally ON | OFF |
| | X19 | J2-10 | Frequency Inverter Operation Input | X19 | ON | Normally ON | OFF |
| | X20 | J3-1 | Electrical Input | X20 | ON | Normally ON | OFF |
| | X21 | J3-2 | Thermo-switch Input | X21 | ON | Normally ON | OFF |
| | X24 | J3-3 | Releveling condition input | X24 | ON | Normally ON | OFF |
| | X25 | J3-4 | Releveling inductor signal input | X25 | | | |
| | X26 | J3-5 | Multifunction input | X26 | | | |
| | X27 | J3-6 | Multifunction input | X27 | | | |
| | X28 | J5-3 | Multifunction input | X28 | | | |
| | X29 | J5-4 | Multifunction input | X29 | | | |
| | X30 | J5-5 | Multifunction input | X30 | | | |
| | X22+ | J6-1 | Emergency Stop Input+ | X22 | ON | Normally ON | OFF |
| | X22- | J6-2 | Emergency Stop Input- | | | | |
| | X23+ | J6-3 | Door Interlock Input + | X23 | ON | Normally ON | OFF |
| | X23- | J6-4 | Door Interlock Input - | | | | |
| Display Board in the car | KMV1 | J9-2 | Door Open Limit Position Input | U07 | ON | Normally ON | OFF |
| | GMV1 | J9-3 | Door Close Limit Position Input | U06 | ON | Normally ON | OFF |
| | KAB1 | J9-4 | Safety Edge 1 Input | U18 | ON | Normally ON | OFF |
| | CZ | J9-5 | Overloaded Input | U15 | ON | Normally ON | OFF |
| | MZ | J9-6 | Full Loaded Input | U13 | ON | Normally ON | OFF |
| | KAB2 | J9-7 | Safety Edge 2 Input | U17 | ON | Normally ON | OFF |
| | QZ | J9-8 | Light Loaded Input | U14 | ON | Normally ON | OFF |
| | KZ | J9-9 | No load Input | U16 | | Normally ON | |
| | SZH | J9-10 | Manual Input | U10 | | Normally ON | |
| | KMV2 | J10-5 | Door Open Limit Position 2 Input | U05 | ON | Normally ON | OFF |
| | GMV2 | J10-6 | Door Close Limit Position 2 Input | U04 | ON | Normally ON | OFF |
| | SZY | J10-1 | Special Input | U08 | | Normally ON | |
| | SZS | J10-2 | Direct Drive Input | U12 | | Normally ON | |
| | ZHS | J10-3 | Manual Orientation Up | 无 | | Normally ON | |
| | ZHX | J10-4 | Manual Orientation Down | 无 | | Normally ON | |

▲**Note: If upper and lower limit positions loops are normal, ON is displayed. If upper and lower limit**

**positions loops are abnormal, OFF is displayed.**

### 13. Setting of car signal input level

When car input signal is normally open contact, the setting is on, if it is normally close contact, the setting is OFF.

```
          ┌──────────────────────────┐
      ┌──▶│   Output Type Enter      │
      │    ├──────────────────────────┤
      │    │   输出有效电平           │
      │    └──────────────────────────┘
      │              │ Enter
      │              ▼
 Esc  │    ┌──────────────────────────┐
      ├────│   Output Type            │
      │    │   Y00: On                │
      │    ├──────────────────────────┤
      │    │   闭合有效               │
      │    └──────────────────────────┘
      │              │
      │              ▼
 Esc  │    ┌──────────────────────────┐
      └────│   Output Type            │
           │   Y01: Off               │
           ├──────────────────────────┤
           │   断开有效               │
           └──────────────────────────┘
                     ┊
                     ▼
```
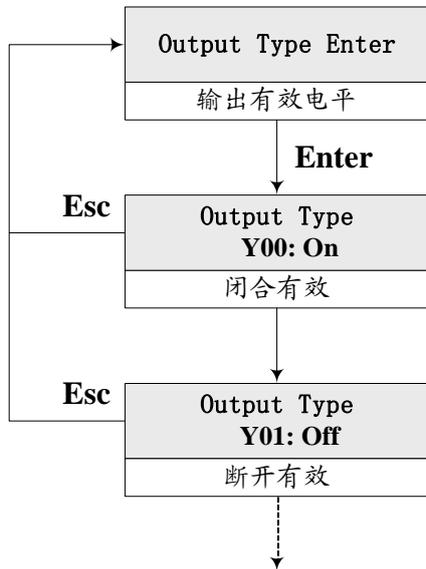
The car input signals represented by U00-U23 are as shown in the following table. The setting for the input with * in the table is void (some buttons and switches within the car do need to have input level setting). After finishing setting, please check on the Monitor Menu to see if the car input signal is displayed to be valid and consistent with what is actually used.

**Table 5-4-3 Car Signal Table**

| No. | Definition | Level type | No. | Definition | Level type | No. | Definition | Level type |
|---|---|---|---|---|---|---|---|---|
| U00 | Door close button1 | ON | U07 | Door open limit 1 | OFF | U14 | Under load switch | ON |
| U01 | Door open button 1 | * | U08 | Dedicated switch | * | U15 | Overload switch | ON |
| U02 | Door open button 2 | * | U09 | Door open delay switch | * | U16 | No-load (Standby) | * |
| U03 | Door close button 2 | * | U10 | Attendant switch | * | U17 | Safety shoe switch 2 (for rear opening) | OFF |
| U04 | Door lose limit 2 | OFF | U11 | Standby | * | U18 | Safety shoe switch 1 | OFF |
| U05 | Door open limit 2 | OFF | U12 | Non-stop switch | * | U19～U23 | Standby | |
| U06 | Door close limit 1 | OFF | U13 | Fullload switch | ON | | | |

### 14. Setting of output relay contact type

When the output relay is at normally open contact, the setting will be ON, if normally close contract, the setting is

OFF. The factory setting is ON.

```
        ┌──────────────────────────┐
  ┌────▶│   Output Type Enter      │
  │     ├──────────────────────────┤
  │     │      输出有效电平          │
  │     └──────────────────────────┘
  │                  │
  │               **Enter**
  │                  ▼
Esc   ┌──────────────────────────┐
  │   │      Output Type         │
  ├───│       **Y00: On**        │
  │   ├──────────────────────────┤
  │   │        闭合有效           │
  │   └──────────────────────────┘
  │                  │
  │                  ▼
Esc   ┌──────────────────────────┐
  │   │      Output Type         │
  └───│       **Y01: Off**       │
      ├──────────────────────────┤
      │        断开有效           │
      └──────────────────────────┘
                    ┊
                    ▼
```
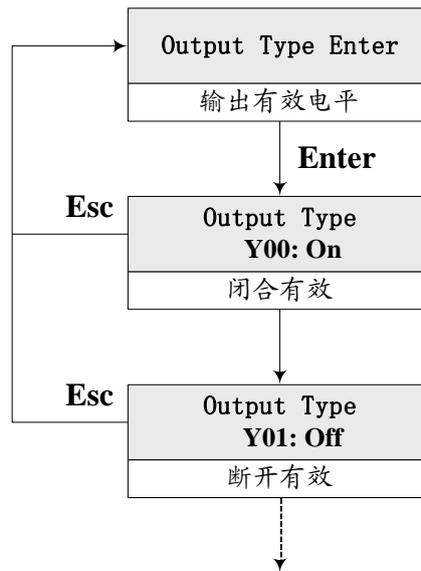
**▲Note: output relay Y12 shall be set to OFF as the enable signal when using Fuji inverter.**

**15. Setting of floor indication**

Set the indication symbol (to indicate the floor) for each floor, it can be English letters or numbers with symbols.

```
        ┌──────────────────────────┐
  ┌────▶│  Set Indication Enter    │
  │     ├──────────────────────────┤
  │     │      层站显示设置         │
  │     └──────────────────────────┘
  │                  │
  │               **Enter**
  │                  ▼
Esc   ┌──────────────────────────┐
  │   │     Set Indication       │
  ├───│     01:          -1      │
  │   ├──────────────────────────┤
  │   │   绝对楼层: 显示楼层       │
  │   └──────────────────────────┘
  │                  │
  │                  ▼
Esc   ┌──────────────────────────┐
  │   │     Set Indication       │
  └───│     02:           1      │
      ├──────────────────────────┤
      │   绝对楼层: 显示楼层       │
      └──────────────────────────┘
                    ┊
                    ▼
```
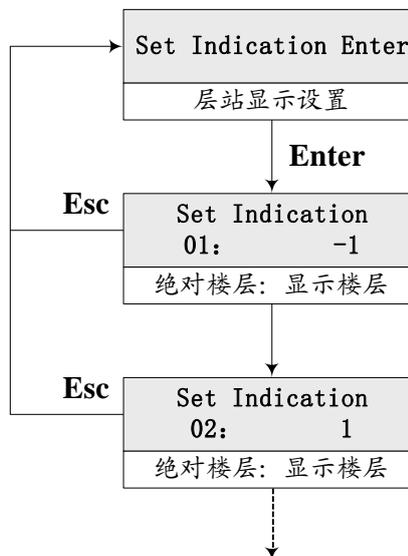
The display setting in the general parameter could set the third position as the display setting position, the second position as numbers, letters and symbols. Only the following capital letters could be set at the third position, ABCDEFGHIJKLMNO. If two positions are only needed, please set the initial two positions, and the third one is set vacant; (The function for displaying the third position should match with the program of the call board, or all the three positions could not be displayed.)

**16. Setting of stop floor**

Set if landing each floor is needed. (**On** refers to the landing floor, **OFF** refers to non landing floor.)

```
        ┌──────────────────────────┐
    ┌──→│   Set Stop Floor Enter   │
    │   ├──────────────────────────┤
    │   │        停站层设置          │
    │   └──────────────────────────┘
    │                │  Enter
    │                ↓
Esc │   ┌──────────────────────────┐
    │   │   Set Stop Floor         │
    │   │   01:            ON      │
    │   ├──────────────────────────┤
    │   │      绝对楼层：停靠        │
    │   └──────────────────────────┘
    │                │
    │                ↓
Esc │   ┌──────────────────────────┐
    │   │   Set Idication          │
    └───│   02:            OFF     │
        ├──────────────────────────┤
        │      绝对楼层：不停靠      │
        └──────────────────────────┘
                     ┆
                     ↓
```
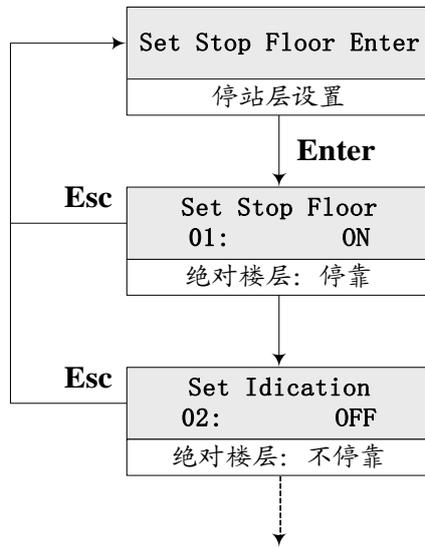
## 17. Setting of open delay able

Door open delay time is valid. (Optional)

```
    ┌──────────────────────────┐
┌──→│  Open Delay Able Enter   │
│   ├──────────────────────────┤
│   │       开门延长使能         │
│   └──────────────────────────┘
│                │  Enter
│                ↓
│   ┌──────────────────────────┐
│Esc│  Open Delay Able         │
│   │       No/Yes             │
│   ├──────────────────────────┤
└───│        无/有              │
    └──────────────────────────┘
```
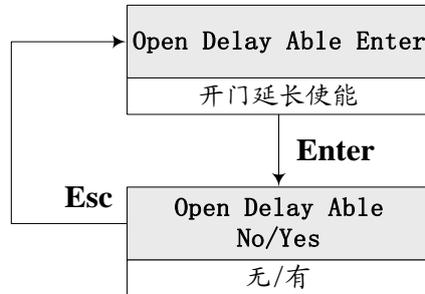
## 18. Setting of load inspection output voltage

The range of load compensation output voltage (set the voltage range according to the requirements for the inverter.)

```
    ┌──────────────────────────┐
┌──→│    Load Give Enter       │
│   ├──────────────────────────┤
│   │         补偿电压          │
│   └──────────────────────────┘
│                │  Enter
│                ↓
│Esc┌──────────────────────────┐
│   │    Load Give             │
└───│    -10V～+10V            │
    └──────────────────────────┘
```
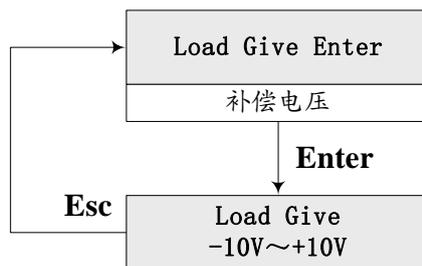
## 19. Setting of brake feedback inspection able

```
    ┌──────────────────────────┐
┌──→│  Break Feedback Enter    │
│   ├──────────────────────────┤
│   │        抱闸反馈           │
│   └──────────────────────────┘
│                │  Enter
│                ↓
│Esc┌──────────────────────────┐
│   │  Break Feedback          │
└───│       Yes                │
    └──────────────────────────┘
```
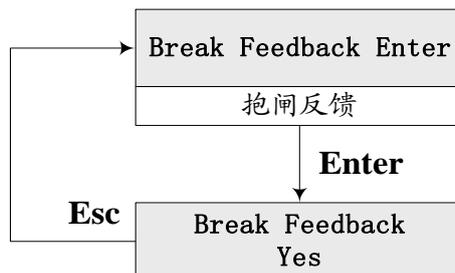
（1）Select **Yes,** the system will inspect the brake feedback. Select **No,** the system will not inspect it.

（**2**）It is suggested that an inspection switch is installed on the traction machine brake and connect this switch signal to the system and select this function.

## 20. Setting of rear opening action selection
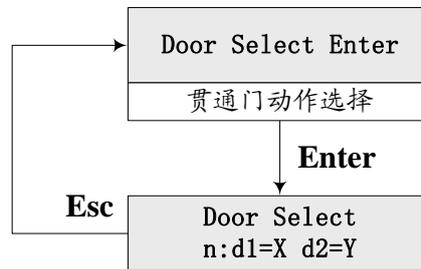


**n**：refers to the elevator floor. It could be changed by pressing ∧ or ∨ key.

**d1**：refers to the front door. Select it by pressing ＞ key.

**d2**：refers to the rear door. Select it by pressing ＞ key.

**x**：it could be set as **Y** or **N**. **Y** means the door will open. **N** means the door will not open. **Y** or **N** could be switched by pressing ∧ or ∨ key.

**For example,** only the front door of a given elevator with rear opening will open when the elevator stops at 6th floor, the rear door will not open. When the elevator stops at 7th floor, both the front and rear doors will open.

The program should be set as followings:



## 21．Input function selection
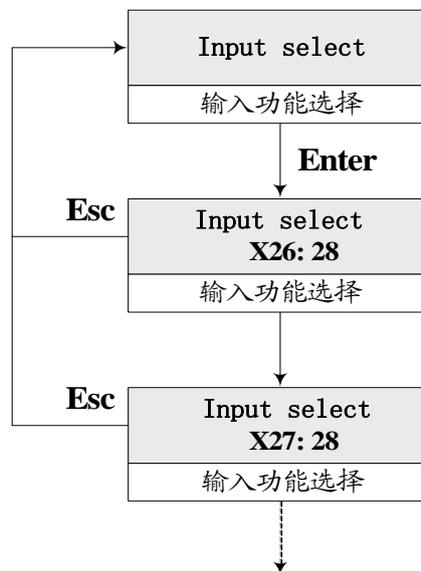


**Table 5-4-4-Setting of input functions**

| Function No. | Definition | Function No. | Default input level setting |
|---|---|---|---|
| 0 | Inspection Input | 17 | Brake contactor feedback input |
| 1 | Upward Input | 18 | Emergency auto leveling running input |
| 2 | Downward Input | 19 | Inverter running input |

| | | | |
|---|---|---|---|
| 3 | Upper terminal station 2 input | 20 | Electric lock input |
| 4 | Lower terminal station 2 input | 21 | Thermo-switch Input |
| 5 | ▲Upper Limit Input | 22 | |
| 6 | ▲Lower Limit Input | 23 | |
| 7 | Upper terminal station 1 input | 24 | Releveling condition input |
| 8 | Lower terminal station 1 input | 25 | Releveling inductor signal input |
| 9 | Upper leveling input | 26 | Standby |
| 10 | Lower leveling input | 27 | Standby |
| 11 | Inverter Fault Input | 28 | Standby |
| 12 | Fire Input | 29 | |
| 13 | Emergency Stop Input | 30 | |
| 14 | Door Interlock Input | | |
| 15 | *Brake feedback input/Main Power Supply Contactor Input | | |
| 16 | Auxiliary contactor input | | |

Input ports of X26, X27, X28, X29, and X30 have multifunctional input functions. Setting the corresponding function numbers, X26, X27, X28, X29, X30 could replace partial functions of X0-X21 inputs;

When setting multifunctional input, if the function number of a certain port has already existed, the system will send the notice for the wrong input, this setting is null. For example, port X28 has been set to "1" (upward input), when resetting X29 to "1", after pressing "Enter" key (OK), the system will notify that "X28 already set 1", thus the function number of X29 will be kept unchanged. **Therefore, if X29 is needed to be set "1", X28 must be set as another unused function number or "28" (backup input).**

It is not recommended to change the setting of input port.

Note: signal input of end station and door zone require high immediacy, multifunctional input port can't replace its input function.

## 22．Output function selection
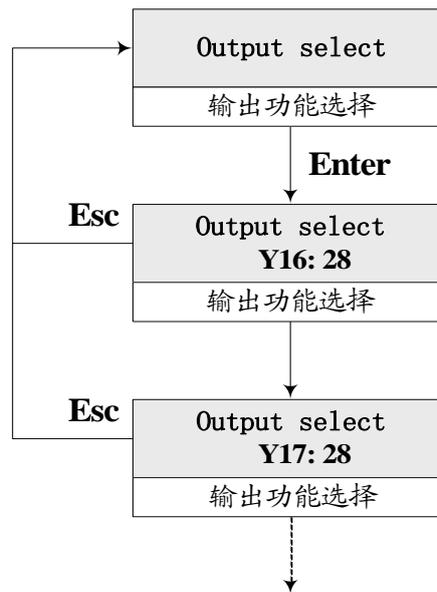


Output ports Y16- Y17 of new main board BL2000-STB-V9 are multifunctional output ports. Set as corresponding function numbers, Y16 - Y19 will output the corresponding functional signals.

**Table 5-4-5-Output set**

| Function No. | Definition | Function No. | The default setting of input electrical level |
|---|---|---|---|
| 0 | Releveling Output | 8 | Main contactor control output |
| 1 | Fire Linkage Output | 9 | Auxiliary contactor control output |
| 2 | Door Open 2 Contactor Control Output | 10 | Frequency inverter upward control output |
| 3 | Door Close 2 Contactor Control Output | 11 | Frequency inverter downward control output |
| 4 | Door Open 1 Contactor Control Output | 12 | Frequency Inverter Able Control Output |
| 5 | Door Close 1 Contactor Control Output | 13 | Multi Speed Command 1 Control Output |
| 6 | Brake Control Output | 14 | Multi Speed Command 2 Control Output |
| 7 | Economical Type Resistance Control Input | 15 | Multi Speed Command 3 Control Output |

➢ The range of ports with multifunctional output setting function: from Y0 to Y15;

➢ The setting method of multifunctional output is the same as "multifunctional input setting".

**When setting the multifunctional output, please pay attention to if the COM end of this function is applicable, or some relevant elements will be damaged!!!**

## 5.5. The setting and operation of run parameter menu

### 5.5.1. Table of run parameter

Table 5-5-1 Table of run parameter

| Serial No. | Chinese | English | Factory Data | Range | Description |
|---|---|---|---|---|---|
| Customer Menu | | | | | |
| 1 | △ 电梯额定速度 | Car Rated Speed | 1.6m/s | 1-2.5m/s | Car speed under the rated rotation speed of the motor |
| 2 | △ 电机额定转速 | Motor Rated Speed | —— | 1-9999r | Motor Speed |
| 3 | △ 编码器脉冲数 | Pulses of Encoder | —— | 500-9999 | Every rotation pulse of the encoder the main computer board received |
| 4 | 检修运行速度 | Insp Speed | 0.3m/s* | 0.01-0.6m/s | Inspection Speed |
| 5 | 起动平滑速度 | Start Speed | 0.00m/s* | 0-0.20m/s | The incremental smooth speed prior to the start curve |
| 6 | 自救运行速度 | Leveling Speed | 0.3m/s* | 0.01-0.6m/s | Leveling Speed |
| 7 | 单层运行速度 | Least Speed | 1m/s* | 0.01-1.0m/s | Stable value in the least speed curve |
| 8 | 提前开闸时间 | Break On Time | 500ms* | 10-9990ms | The interval time between brake on and running curve |
| 9 | 抱闸时间 | Break Off Time | 500ms* | 10-9990ms | The interval time between brake and door automatic open |
| Factory Menu | | | | | |
| 10 | b1 | Acceleration b1 | 0.6* | 0.1- 9.99 | Accelerating gradient |
| 11 | b2 | Deceleration b2 | 0.6* | 0.1- 9.99 | Decelerating gradient |
| 12 | P1 | S Curve P1 | 0.7* | 0.1- 9.99 | S time 1 |
| 13 | P2 | S Curve P2 | 0.7* | 0.1- 9.99 | S time 2 |
| 14 | P3 | S Curve P3 | 0.7* | 0.1- 9.99 | S time 3 |
| 15 | P4 | S Curve P4 | 0.7* | 0.1- 9.99 | S time 4 |
| 16 | 零速设置 | Zero Speed Setting | 5rpm* | 0- 9999 | Threshold value of zero speed |
| 17 | 零速时间 | Zero Speed Time | 210ms | 0-999ms | The delay brake time after the system detected the zero speed |
| 18 | 运行信号等待时间 | Run Input Time | 400 | 0-9990ms | The main board delays for this long time to take off the brake after receiving the running signal (X19) from the inverter . |
| 19 | 起动平滑时间 | Start Speed Time | 0 | 0-9000ms | Duration of start speed time |
| 20 | 平层调整 | Leveling Adj | 50mm | | Adjust the difference upward/downward leveling |
| 21 | 负载补偿调整 | Load | 0 | 0-12 | Adjust load compensation output voltage |

| | | Compensation Adj | | | according to the floor |
|---|---|---|---|---|---|
| 22 | 提前开门速度 | Open Door Speed | 0.15 | 0-0.3m/s | Open door speed of an elevator |
| 23 | 再平层停止速度 | Relevel Stop Speed | 0.30 | 0-0.3m/s | In the process of door open or re-leveling, if the speed is higher than door open speed or re-leveling speed, the elevator will stop running. |
| 24 | 再平层运行速度 | Re-leveling Run speed | 0.06 | 0-0.3m/s | Re-leveling run speed is set during the given simulation |
| 25 | 关照明延时时间 | Lamp off time | 15 | 0-599m | Lamp off time |
| 26 | 到站信号延时时间 | Beep delay time | 100 | 0-9990ms | Beep delay time |
| 27 | 使能延时时间 | Enable delay time | 0 | 0-9990ms | Enable is switched with such delay time after the inverter switching the direction. |

△ ：The three parameters of car speed, motor speed and pulses of the encoder are so significant that they should be set according to the standard values of the equipment; otherwise the elevator can not run normally. (For example, inaccurate speed measurement, or the deviation of speed changing points, etc) If any one of three parameters is changed, the elevator can normally run after another self learning of hoistway. When the feedback pulses the system received is the pulses obtained after the frequency division, the set encoder pulses should be calculated, which is not the actual value of the encoder.

▲Note: **This system requires that the pulses of the encoder should be more than 500 wires (the encoder pulse of gearless permanent magnet synchronous traction machine should be more than 4096 wires), the pulse frequency of it should range from 6kHz to 25kHz.**

E.g.: Set the encoder as 1024 pulse/r，after two frequency divisions, the pulses of encoder is 1024/2=512.

Both motor speed and car speed should meet the following requirement:

$$Car\ Rated\ Speed = \frac{Rated\ RMS\ of\ Motor * Diameter\ of\ Traction\ Sheave * 3.14 * Reduction\ Ratio}{60 * 1000 * Traction\ Ratio}$$

**E.g.:** Motor speed is 1370 r/m，the diameter of traction sheave is 590 mm，speed reduction ratio is 2/53，the traction ratio is 1/1，thus：

$$Car\ Rated\ Speed = \frac{1370 * 590 * 3.14 * 2}{60 * 1000 * 1 * 53} = 1.6\ ^{m}/_{s}$$

This interface is used for parameter setting related to the elevator run speed.

| Runing Para Enter |
|:---:|
| 运行参数 |

Press **Enter** key to start parameter setting.

## 1. Setting of car rated speed

The car rated speed is calculated by motor rated speed, traction ratio, speed reduction ratio and the diameter of traction sheave.

Note：**The car rated speed is used to calculate its proportional relation with car speed at the motor rated**

**rotary speed. Changing this parameter can not change the actual running speed of the elevator.**

```
       Car Speed
       1.6 m/s
   电梯额定速度
```

## 2. Setting of rated motor speed

The motor rated speed is set according to the parameters on the motor nameplate.

```
      Motor Speed
      1470 rpm
    电机额定转速
```

## 3. Setting of pulses of encoder

Pulses of encoder: refers to the pulses entering the main control board. Under the motor speed, when the pulse frequency of the encoder output is smaller than **25kHz,** directly access the encoder signal. When the pulse frequency is larger than **25kHz,** the encoder signal should be accessed after frequency division, but the signal frequency after frequency division must not be smaller than **6kHz.**

```
    Pulses 1024 PPR
   编码器每转脉冲数
```

**▲Note: Car rated speed, motor rated speed and pulses of encoder are the three significant parameters to decide if the elevator should normally run, if any one of the three parameters is changed, another self learning of hoistway is needed.**

## 4. Inspection speed

Set inspection speed. According to some relevant provisions, the maintenance speed cannot be higher than **0.6m/s.**

```
      Insp Speed
      0.30 m/s
    检修运行速度
```

## 5. Setting of start speed

If the start resistance of the traction machine is too high, appropriately increase the smooth start speed. If the smooth start speed is set to 0, it will not take effect.

```
      Start Speed
      0.00 m/s
    启动平滑速度
```

## 6. Setting of leveling speed

When the elevator stops in the non door zone due to some faults, if the elevator is in the safe loop, after the

inverter returns to the normal state, the elevator could automatically stop (run to the door zone by self rescue).This interface should be used to set self-rescue speed within the range **0.01-0.6m/s**.

```
Leveling Speed
0.30 m/s
自救运行速度
```

## 7. Setting of least speed

（1）The narrowest distance between two buildings for elevator running depends on the stable value of least speed.

（2）If the elevator speed is higher than **1.5m/s,** mono floor/ multi floors running of the elevator has various stable values.

（3）If the distance between two buildings is too narrow, reduce the least speed which should be ranged from **0.8m/s** to **1.0m/s.**

```
Least Speed
1.00 m/s
单层运行速度
```

## 8. Setting of brake on time

The break on time is to improve the comfort degree at the start point and to make the system fit for the break on time of various tractions machines.

```
Break On Time
50 ms
提前开闸时间
```

## 9. Setting of break off time

Appropriately adjust this parameter, which could make the car open after the brake holds the traction wheel, avoiding car sliding which is caused by earlier removal of stalling torque from the inverter and affecting the comfort degree.

```
Break Off Time
50 ms
抱闸时间
```

## 10. Setting of accelerating gradient b1

```
Acceleration b1
0.6 m/s2
加速斜率b1
```

## 11．Setting of decelerating gradient b2

```
Deceleration b2
0.6m/s²
减速斜率b2
```

## 12．S Time 1-Setting of P1

| |
|---|
| S Curve P1<br>0.6 m/s2 |
| S曲线**P1** |

## 13．S Time 2-Setting of P2

| |
|---|
| S Curve P2<br>0.6 m/s2 |
| S曲线**P2** |

## 14．S Time 3-Setting of P3

| |
|---|
| S Curve P3<br>0.6 m/s2 |
| S曲线**P3** |

## 15．S Time 4-Setting of P4

| |
|---|
| S Curve P4<br>0.6 m/s2 |
| S曲线**P4** |

**▲Note:**

◇ Six parameter of **b1, b2, P1, P2, P3, P4** are used for setting adjustment of running curve. The comfort degree of an elevator could be adjusted by these six parameters (besides the curve, the comfort degree will be affected by the parameter of the inverter). For the corresponding relationship of **b1, b2, P1, P2, P3, P4** and the curve, please refers to the following diagram.
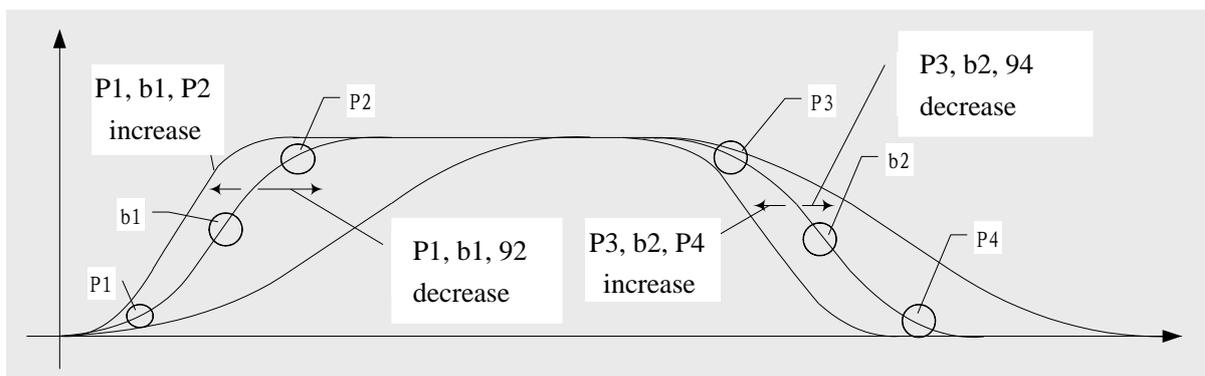


**Figure 5-5-1-9 The diagram of speed curve parameter adjustment**

◇ Increase the parameter value, the corresponding part of the curve gets steeper; decrease the parameter value, the corresponding part of the curve gets flatter; appropriately adjusting above six curves parameter can acquire better comfort degree and satisfy some relevant requirements in the clauses of the elevator standard.

## 16. Setting of zero speed

When the motor speed is lower than this speed, the system considers that the elevator speed is zero and it outputs brake signal.

```
┌─────────────────────────┐
│      Zero Speed         │
│      0005 rpm           │
├─────────────────────────┤
│   零速设置: 5转/分        │
└─────────────────────────┘
```

This value could be as smallest as 0 during the given simulation. This value should be greater than or equal to 1 when multi speeds are given.

**17．Zero speed time**

Appropriately adjust this parameter, after the speed of the elevator becomes zero for a while and brake, so as to achieve zero speed braking.

```
┌─────────────────────────┐
│      Zero Time          │
│      210ms              │
├─────────────────────────┤
│      零速时间            │
└─────────────────────────┘
```

**18. Run Input Time**

After receiving the running signal (X19) from the inverter, the main board will delay such long time to take off the brake.

```
┌─────────────────────────┐
│    Run InputTime        │
│      400ms              │
├─────────────────────────┤
│   运行信号等待时间        │
└─────────────────────────┘
```

**19．Start speed time**

Duration for the start speed.

```
┌─────────────────────────┐
│   Sart Speed Time       │
│                         │
├─────────────────────────┤
│   起动平滑时间           │
└─────────────────────────┘
```

**20．Leveling adjustment**

If the ascending and descending for one elevator of every floor can't park at the same position, adjust this parameter (if the ascending parking position is higher, and the descending position is lower, increase the parameter, or, contrarily decrease the parameter. The adjustment quantity should be half of the leveling difference (the default value is **50mm).**

```
              ┌──────────────────────────┐
         ┌───►│ Leveling Adjust Enter    │
         │    ├──────────────────────────┤
         │    │        平层调整           │
         │    └──────────────────────────┘
         │               │ Enter
    Esc  │               ▼
         │    ┌──────────────────────────┐
         └────│   Leveling Adjust        │
              │        50 mm             │
              ├──────────────────────────┤
              │         无/有             │
              └──────────────────────────┘
```
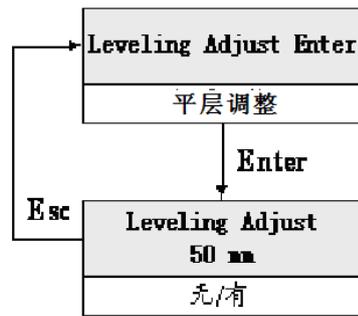
## 21．Load compensation adjustment

In the synchronous control system, the elevator on the lower floors is not provided with compensation chains, so the weighing apparatus of our company can only weigh the car load, but can't weight the weight change of steel wire rope of each floor. The systems make the adjustment through adding load compensation adjustment parameter to the running parameters.

```
┌──────────────────────────┐
│        Load Adj          │
├──────────────────────────┤
│        负载补偿调整        │
└──────────────────────────┘
```

Adjustment Method：1. Perform no load and full loaded self learning；

2. Run the no load elevator to the top floor；

3. Set the compensation output voltage between -8V to +8V (smaller than ±8 volt for the margin for adjustment）；

4. Adjust the simulating load compensation gain of the inverter and make the car not slide when the car runs downwards, the gain at this time is the reasonable value;

5. Run the no load elevator to the bottom floor，increase the load compensation adjustment parameter and make the car not slide when the car runs upwards from the bottom floor, the parameter at this time is the reasonable value;

6. Save the system parameter.

Note: This function is only applicable to the edition higher than 700_33, the adjustment range for this parameter is from 0 to 12.

## 22．Open door speed

It refers to the advance door opening speed after the elevator normally runs and changes the speed and finally enters in the re-leveling door zone.

Note：When running with multi speed (the speed at dual doors zone is zero FU02=ON) , the creeping speed after speed changing must be smaller this speed.

```
┌──────────────────────────┐
│     Open door speed      │
├──────────────────────────┤
│        提前开门速度        │
└──────────────────────────┘
```

## 23．Re-leveling stop speed

In the process of door open or re-leveling, if the speed is higher than this speed, the elevator stops running.

```
┌─────────────────────────┐
│     Relevelst speed      │
├─────────────────────────┤
│       再平层停止速度        │
└─────────────────────────┘
```

## 24．Re-leveling run speed

The re-leveling run speed set when the simulation is given.

```
┌─────────────────────────┐
│     Relevelrun speed     │
├─────────────────────────┤
│       再平层运行速度        │
└─────────────────────────┘
```

## 25．Lamp off time

The set unit is minute, and the setting range is from 0 to 999 minutes. Under the automatic state, if there is no any car selection or hall call during this period of time, the system will cut off the power supply of the illumination via the operation panel.

```
┌─────────────────────────┐
│      Lamp off time       │
├─────────────────────────┤
│       关照明延时时间        │
└─────────────────────────┘
```

## 26．Beep delay time

The set unit is millisecond, and the set range is from 0 to 5000 milliseconds (0 to 5 seconds); The elevator runs to the aim floor after speed changing, delay this set time to output arrival signal to make the system voice synthesizer or arrival gong beep at a later time.

```
┌─────────────────────────┐
│      Beep delay time     │
├─────────────────────────┤
│      到站信号延时时间        │
└─────────────────────────┘
```

## 27. Enable delay time

Inverter delay such long time to change the enable after changing the direction.

```
┌─────────────────────────┐
│     Enable delay Time    │
│         0000ms           │
├─────────────────────────┤
│       使能延时时间          │
└─────────────────────────┘
```

## 5.6. The setting and operation of special parameters menu

### 5.6.1. Special parameter table

**Table 5-6-1 Special Parameter Table**

| Serial No. | Chinese | English | Factory data | Range | Description |
|---|---|---|---|---|---|
| **User Menu** | | | | | |
| 1 | 门继电器保持时间 | Door Run Time | 5s* | 0- 999s | Open/Close Door Run Time |
| **Factory Menu** | | | | | |
| 2 | 恢复出厂值 | Restore to the Factory Parameter | NO | | Restore to the factory parameter |

| 3 | 并联使能 | Duplex Control | 0* | 0- 1 | (Optional) |
|---|---|---|---|---|---|
| 4 | 群控使能 | Group Control | 0* | 0- 1 | (Optional) |
| 5 | 远程监控 | Remote Monitoring | 0* | 0- 1 | Set remote monitoring able and calling telephone number (optional) |
| 6 | 贯通门方式 | Rear opening Mode | 0* | 0- 1 | (Optional) |
| 7 | 消防方式 | Fire Mode | 0* | 0- 1 | (Optional) |
| 8 | 并联梯号 | Duplex Elevators No. | 0* | A/B | If the duplex able is effective, any elevator could be A, the other one is B. |
| 9 | 多段速度方式 | Multi Speed Mode | No* | Yes/No | Yes：multi speed specified, No：simulation speed specified. |
| 10 | 多段速度设置 | Multi Speed Setting | 0* | 0-4m/s | When (9) is Yes，set the speed value for various speeds (corresponds to the given rotary speed of the inverter) . |
| 11 | 换速距离 | Decel Distance | 0* | 0-10m | Correspond to decelerating distance of various speeds. |
| 12 | 运行超时时间设置 | Over Time | 45* | 0-999s | The time limit for once running time |
| 13 | 语言选择 | Language selection | 0 | 0/1 | 0: English; 1: Chinese |
| 14 | 特殊功能选择 | Special Function Selection | OFF | OFF/ON | |

a) **Note：The factory parameters with ∗ symbols can be initialized, it can be restored to the factory default after the operation to restore.**

**Read Para and Write Para parameters among special parameters are used for copying and writing in parameters when connecting to computer. The parameter Color Set is valid only when multi-color backlight LCD is used.**

### 5.6.2. Setting and operation

This interface could made customer set some parameters according to the special requirements.

| Special Para Enter |
|---|
| 特殊参数 |

**1. Setting of Open/Close Door Run Time**

（**1**）After sending the command of door opening or closing, the holding time of this command is set therefrom;

（**2**）When there is no door open or close limit in the door machine system, the open/close door run time is set on this interface;

（**3**）When there is door open or close limit in the door machine system, the set value of this time should be 1 second longer than the actual opening or closing time.

| Door Run Time |
|---|
| 005 s |
| 开/关门运行时间 |

## 2. Restore to the factory fault

Restore to the set factory fault.

```
          ┌─────────────────────────┐
      ┌──▶│   Factory para  Enter   │
      │   ├─────────────────────────┤
      │   │        设置出厂参数        │
      │   └─────────────────────────┘
      │                │ Enter
      │                ▼
 Esc  │   ┌─────────────────────────┐
      └───│      Factory para       │
          │        Yes/No?          │
          └─────────────────────────┘
```
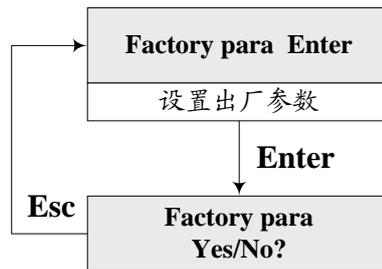
Select **Yes** and the parameters will be restored to the factory fault. When the system debugging parameters setting is disordered and needed to be reset, this function should be applied.

## 3. Setting of duplex able

**Yes**：parallel running, **No**：single elevator running

```
          ┌─────────────────────────┐
      ┌──▶│   Twins Control  Enter   │
      │   ├─────────────────────────┤
      │   │          并联使能         │
      │   └─────────────────────────┘
      │                │ Enter
      │                ▼
 Esc  │   ┌─────────────────────────┐
      └───│      Twins Control       │
          │        Yes/No?          │
          └─────────────────────────┘
```
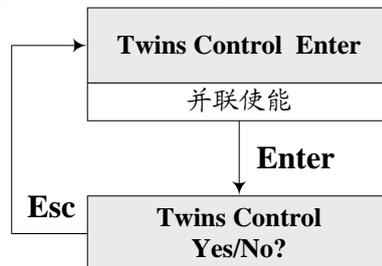
## 4. Setting of group control enable

**Yes**：group control running，**No**：single elevator running (only if the customer requires the factory to provide this function, setting group control is effective) .

```
          ┌─────────────────────────┐
      ┌──▶│   Group Control  Enter   │
      │   ├─────────────────────────┤
      │   │          群控使能         │
      │   └─────────────────────────┘
      │                │ Enter
      │                ▼
 Esc  │   ┌─────────────────────────┐
      └───│      Group Control       │
          │        Yes/No?          │
          └─────────────────────────┘
```
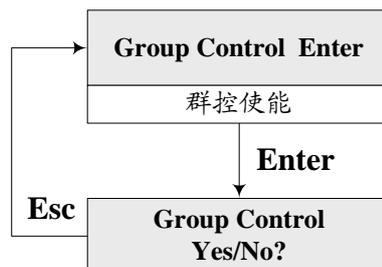
## 5. Setting of remote monitoring

**Yes**：with the function of remote monitoring,

**No**：without the function of remote monitoring, (valid only if the customer requires the factory to provide this function)

```
         ┌─────────────────────────┐
    ┌───▶│   Far Monitor  Enter    │
    │    ├─────────────────────────┤
    │    │        远程监控          │
    │    └─────────────────────────┘
    │                 │ Enter
    │                 ▼
Esc │    ┌─────────────────────────┐
    │    │      Far Monitor        │
    │    │        Yes/No?          │
    │    └─────────────────────────┘
    │                 │
    │                 ▼
Esc │    ┌─────────────────────────┐
    │    │       Call No. 1        │
    │    │     024-23787759        │
    │    ├─────────────────────────┤
    │    │        呼叫号码1         │
    │    └─────────────────────────┘
    │                 │
    │                 ▼
Esc │    ┌─────────────────────────┐
    └────│       Call No. 2        │
         │     024-23787750        │
         ├─────────────────────────┤
         │        呼叫号码2         │
         └─────────────────────────┘
```
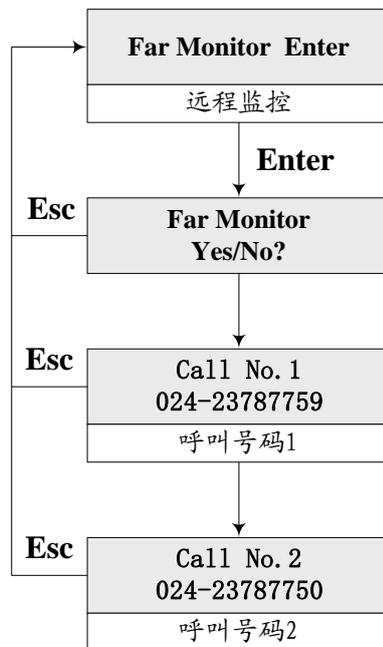
The calling number can only be set if the function of remote monitoring is set **Yes**. If there is something wrong with the elevator, the system will automatically call the set telephone number. Remote monitoring could call two telephone numbers at maximum.

## 6. Rear opening mode

### (1) Mode selection

Referring to the door open modes when there are front/rear door on the same floor of an elevator; mode 0-n can be designed according to the customer's requirements.

```
         ┌─────────────────────────┐
    ┌───▶│   Two Door Mode  Enter  │
    │    ├─────────────────────────┤
    │    │         贯通门           │
    │    └─────────────────────────┘
    │                 │ Enter
    │                 ▼
Esc │    ┌─────────────────────────┐
    │    │      Two Door Mode       │
    └────│        Mode  0          │
         ├─────────────────────────┤
         │      方式0（0～n）        │
         └─────────────────────────┘
```
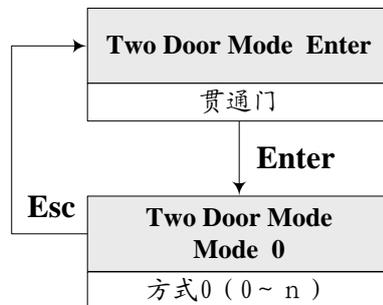
**n=0**：non rear opening mode

**n=1**：rear opening mode 1, only one door can act on each floor.

**n=2**：rear opening mode 2, two doors can act on each (some) floor(s), but two doors can't be open simultaneously, if the other side door is open, this door must be closed. (There is one set of internal selective buttons both on the front and rear doors.)

**n=3**：rear opening mode 3, two doors can act on each (some) floor(s), when the car runs to the through floor, both the two doors will open simultaneously. (There is only one set of internal selective buttons in the car, and hall calling address is set as the mode 2.)

**n=4**：rear opening mode 4, two doors can act on each (some) floor(s), when the car normally runs to the through floor, both the two doors will open simultaneously. (There is one set of internal selective buttons both on the front and rear doors.)

**n=5**：rear opening mode 5, two doors can act on each (some) floor(s), when the car normally runs to the through floor, the car door will open according to commands. For example, when parking, if there is

any car selection or hall call for the front door, the front door will open; or there is any car selection or hall call for the rear door, the rear door will open; if there are some car selections or hall calls for both the front and rear doors, both the two doors will open simultaneously. (There is one set of internal input buttons both on the front and rear doors.)

According to the different working modes of the rear opening, the setting of external unit address differs from the car selection port connecting wire of the car operation board; refer to the followings for details:

（2）Setting of hall call board address

◆ When setting the rear opening mode of main control board as **0, 1**, the setting method of hall call board address is the same as the normal mode, please refers to part of 3-2-3-4 (2) in this brochure;

◆ When setting the rear opening mode of s main control board as **2, 3, 4, 5**, the setting method of hall call board address should obey the following principles;

◇ **1-32** is the absolute floor address the front door corresponds to: 1 refers to the bottom floor, 2 refers to the hypo-bottom floor, and 32 floors could be set at most. There are 32 floors totally;

◇ **33-64** is the absolute floor address the rear door corresponds to: 33 refers to the bottom floor, 34 refers to the hypo-bottom floor, and 64 floors could be set at most. There are 32 floors totally;

◇ If there is only one door on a certain floor, thus the address the other door corresponds to is vacant.

Example **1:** If a building has a basement where the front and rear doors of the elevator will open, the hall call board address the front door of the basement corresponds to be 1, and the hall call board address the rear door of the basement corresponds to is 33.

Example **2:** If a building has a basement where there is only one front door, but there are front and rear door on the first floor, thus the hall call board address the front door of the basement corresponds to is 1, the hall call board address the rear door of the basement corresponds to is vacant, the hall call board address the front door of the first floor corresponds to is 2, the hall call board address the rear door of the first floor corresponds to is 34.

◆ The connection of car internal selective buttons:

◇ When setting the rear opening mode of main control board as **0, 1**, the connecting wires of internal selective buttons on **1-N** floor should normally connect to the internal selective ports on the **1-N** floor**;**

◇ When setting the rear opening mode of main control board as **2, 4, 5**: set the total floor number as N, thus car internal selective ports on **1-N** floor correspond to internal selective press buttons of the actuating front door, 1 corresponds to the bottom floor, N corresponds to the top floor. Car internal selective ports on **N+1-2N** floor correspond to internal selective press buttons on the **1-N** floor of the actuating rear door, **N+1** corresponds to the bottom floor, **and 2N** corresponds to the top floor.

**For example:** an elevator has six floors without the basement, there are both front and rear doors on the third floor, and there is only the front floor on the rest floors. The internal selective press buttons of **1-6** floor where only the front door is open should be connected to the internal selective ports of **1-6** floor, the internal selective press buttons of the third floor where the rear door is also open should be connected to the internal selective ports of **N+3=6+3=9th** floor.

Note：When setting the rear opening mode as 1, **2, 3, 4, 5,** please install two sets of press buttons for randomly opening the front or rear door when maintenance

# 7. Setting of fire mode

When setting the fire mode as 1, the elevator only has fire home landing return function.

```
┌─────────────────────────┐
│    Fire Mode  Enter      │
├─────────────────────────┤
│        消防方式           │
└─────────────────────────┘
            │ Enter
            ▼
┌─────────────────────────┐
│      Fire Mode          │
│      Mode  1            │
├─────────────────────────┤
│        方式1             │
└─────────────────────────┘
```
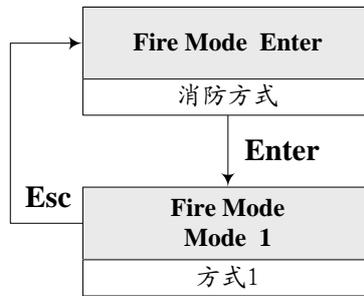
▲**Note: When selecting fire mode 0, please pay attention to checking if the external fire equipments meet the national standards or not, or some unexpected bad results will occur.**

## 8. Setting of parallel elevators No.

When the parallel enable is set as **Yes**，the parallel elevators number should be set as **A** or **B**. The setting interface is as follows:

```
┌─────────────────────────┐
│    Parallel Enter        │
├─────────────────────────┤
│        并联梯号           │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│    Parallel NO          │
│              A          │
├─────────────────────────┤
│        A梯               │
└─────────────────────────┘
```
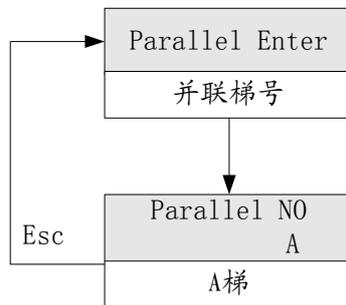
## 9. Setting of multi speeds modes

When using some kinds of inverter which needs multi given speed commands, this parameter is set as **Yes,** the factory fault is **No**.

```
┌─────────────────────────┐
│ Multi Speed Mode  Enter  │
├─────────────────────────┤
│      多段速度方式          │
└─────────────────────────┘
            │ Enter
            ▼
┌─────────────────────────┐
│   Multi Speed Mode      │
│      Yes / No           │
├─────────────────────────┤
│  多段速度/模拟速度方式     │
└─────────────────────────┘
```
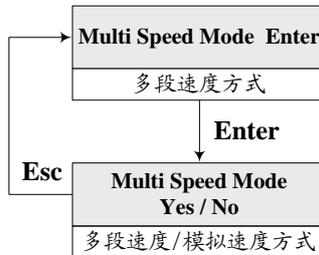
## 10. Setting of multi speeds

When setting multi speeds modes as **Yes**, the setting of multi speed values and speed changing distance must be carried out, refer to the following table for some concrete values (only take it as reference):

**Table 5-6-2-1 Setting of multi speeds values**

| Car speed / Set Value / Parameter | 1.0m/s | 1.5-1.75m/s | 2.0m/s | 2.5m/s |
|---|---|---|---|---|
| V1 | 1m/s | 1.5-1.75m/s | 2.0m/s | 2.5m/s |
| V2 | 0 | 1.0m/s | 1.6m/s | 2.0m/s |
| V3 | 0 | 0 | 1.0m/s | 1.6m/s |
| V4 | 0 | 0 | 0 | 1m/s |

| | | | | |
|---|---|---|---|---|
| S1 | 1.3m | 2.4m | 4.2m | 6.5m |
| S2 | 0 | 1.3m | 2.4m | 4.2m |
| S3 | 0 | 0 | 1.3m | 2.4m |
| S4 | 0 | 0 | 0 | 1.3m |

When setting multi speed values, set **V1** as the speed value the highest speed corresponds to and set **V4** as the speed value the lowest speed corresponds to, the speed unit is **m/s**. After setting the speed values, the LCD interface will display the motor speed calculated according to the elevator speed with the unit of rpm  (**r=rpm**)

▲**Note: to set the inverter, the customer must apply this displayed value as the given value of rotary speed that the inverter corresponds to, or the operation speed of electrical equipment won't satisfy with the requirements.**
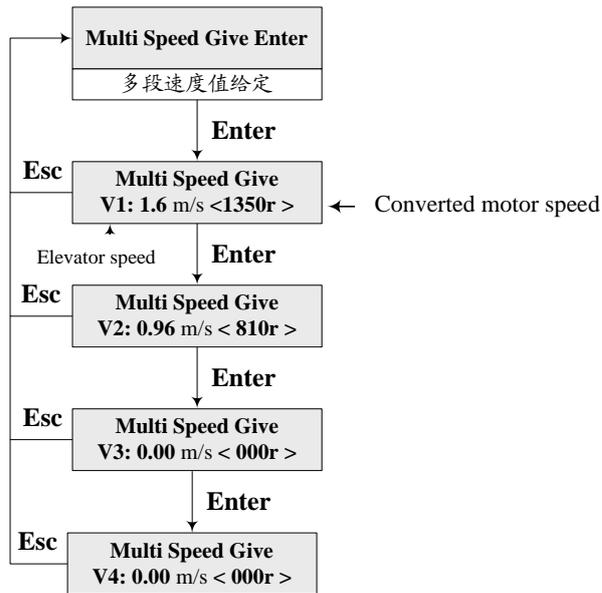


◆ **Multi speeds command output logic**

Multi speeds output commands consist of three output combinations of **Y15, Y14, and Y13**, refer to the following table for their logics.

**Table 5-6-2-2 Multi Speed Command Output Logic**

| Port / Item | Y15 (J7-6) | Y14 (J7-5) | Y13 (J7-4) |
|---|---|---|---|
| Inspection Running Speed /Self Learning Speed | 0 | 1 | 0 |
| Re-leveling Speed | 0 | 0 | 1 |
| Creeping speed | 0 | 1 | 1 |
| Low speed (V1) | 1 | 0 | 0 |
| Medium Speed 1 (V2) | 1 | 0 | 1 |
| Medium Speed 2 (V3) | 1 | 1 | 0 |
| High speed (V4) | 1 | 1 | 1 |

◆ **The examples of multi speeds output**

HighSpeed (V4)

Creep        Stop

Creeping Speed

Zero Speed

Y13

Y14

Y15

Start                Speed change        Door zone changing
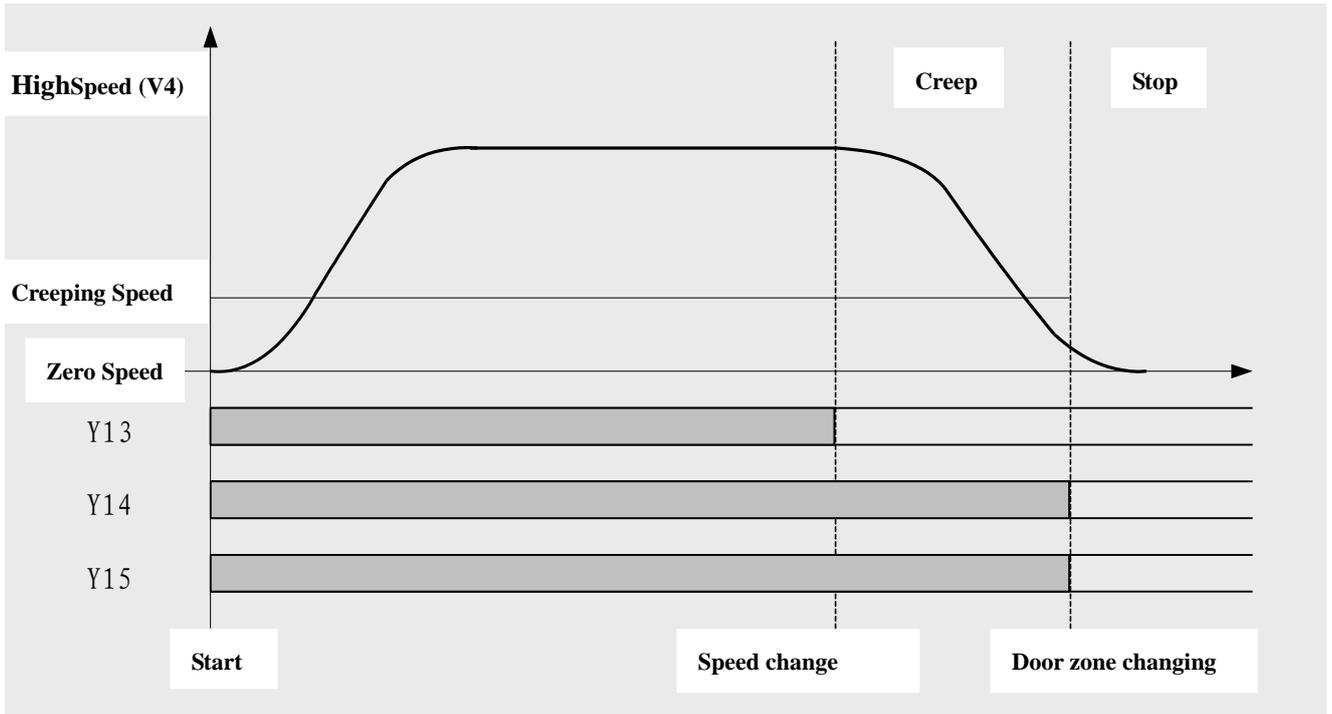
**Table 5-6-2-6 (5)    The diagram of multi speeds output**

▲Note：To set the inverter, the customer must apply this displayed value as the given value of rotary speed that the inverter corresponds to, or the elevator running speed will not satisfy with the requirements.

## 11. Setting of decelerating distance
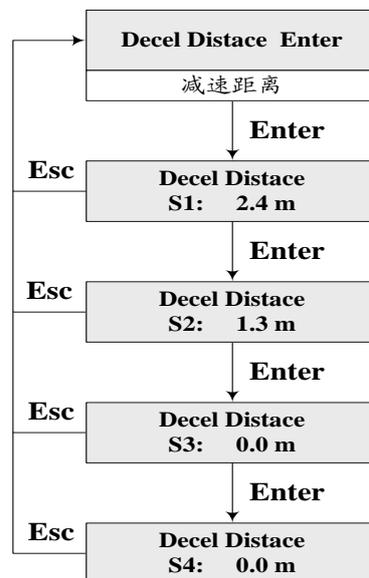


In the multi speed modes, regulating the decelerating distance of different speed stages can prevent the elevator from braking at non zero speed or overlong creeping distance. The decelerating distances which correspond to different speeds are different, which are need to be tested and set separately when debugging. Only take the table 5-6-2-1 in (10) as reference information when setting the parameters.

▲Note: Parameters (10) and (11) are valid only when the multi speeds mode is set as Yes.

## 12. Setting of overtime running

In order to prevent any damage to the system caused by the elevator due to the slipping steel wire rope or car getting stuck, so it is necessary to restrict the time from start to pause when the car is running at the high speed. This parameter is actually the limit value of this time; once the running time of the elevator exceeds this value, the system will stop the car and enter the protection state, and the system will quit this protection state only if the system is supplied with the power again.

The user should set this value according to the elevator speed and building height, the default value is 45 seconds.
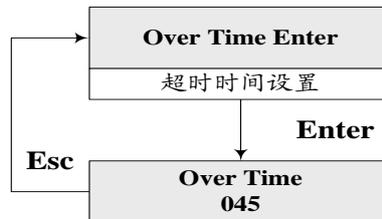


## 13. Language selection

Select Chinese and English display. 0: English; 1: Chinese



## 14. Setting of special functions selection

In order to meet the special requirements of users, there are some nonstandard functions designed in this control system for optional selection of the customers.
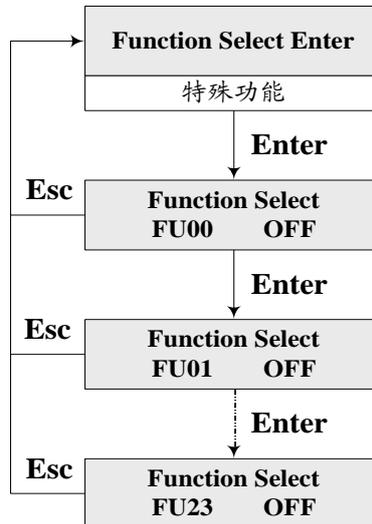


<div align="center">Table 5-6-2-3 Setting of special functions selection</div>

| Function No | Function Description |
|---|---|
| FU00 | After the elevator levels and stops, take the current floor as the benchmark, if there is no external and car selection registration on the floors above the original running direction, cancel all the internal registrations. |
| FU01 | It is used for internal test. |

| FU02 | The elevator runs to the creeping area after changing speed, if it reaches the two doors zone, the inverter speed must be changed to 0, or the default setting is that if the elevator reaches single door zone, the inverter speed must be changed to 0. |
|---|---|
| FU03 | It is used for internal test. |
| FU09 | If **ON** is set：the car selection could be cancelled during the running; If **OFF** is set：the car selection cannot be cancelled during the running. |
| FU10 | If **ON** is set：brake instantly when the run feedback of the transducer becomes effective；If **OFF** is set：brake 0.5 second later after the run feedback of the transducer becomes effective. It is set **ON**, when SIEI inverter with multi speeds is used. |
| FU11 | If **ON** is set: multi speeds logics of KEB F4 inverter will be output; |
| FU12 | If **ON** is set：able, direction and speed are given simultaneously (when SIEI or KEB F4 inverter with multi speeds is used) ；If **OFF** is set：please set it as **OFF,** when SIEI or KEB F4 inverter with multi speeds is not used) |
| FU13 | If **ON** is set: the direction becomes invalid when parking, the elevator will brake at the zero speed (when SIEI inverter with multi speeds is used)；If **OFF** is set: able and direction become invalid simultaneously. |
| FU14 | ON：actuate the functions for disable people used；OFF：without disable people used function |
| FU16 | ON：system should make sure that door close limit position is valid when door lock is closed, OFF：Door lock state has nothing to do with the door close limit position. |
| FU17 | ON：able direction and brake become invalid simultaneously when the elevator stops due to the maintenance，OFF：After braking, the able direction will become invalid 0.5 second later when the elevator stops due to the maintenance. |
| FU18 | ON：only install one set of press button for close and open of the door when there is the rear opening；OFF：two sets of press buttons for close and open of the door when there is the rear opening； |
| FU19 | ON：door open re-levelling able；OFF：Without the re-levelling function. |
| FU20 | ON：advance door open able；OFF：Without the advance door open function. |
| FU21 | ON：door won't open at non door zone position when the elevator is under the maintenance state；OFF：door will open at any position when the elevator is under the maintenance state. |
| FU23 | ON: the serial weighing apparatus which matches with the main board uses SJT-300 of CAN bus, OFF: The serial weighing apparatus which matches with the main board uses SJT-150 of 485 bus mode. |
| FU24 | ON：when the speed is less than 2m/sec , second terminal landing input is used(for the elevator with running speed 1.75m/sec, the two-level enforced changing device should be equipped); OFF：for the elevator with running speed less than 2m/sec, the second terminal landing input can not be used. |
| FU25 | ON：the terminal landing only corrects the floor number and scale; OFF：at multi-stage giving, because of the too large allowance in the terminal landing proofing, ER14 protection occurs. |
| FU26 | OFF: having the function of misoperating internal instruction; having no function of misoperating internal instruction; |
| FU28 | OFF: having underload anti-nuisance function; ON: having on underload anti-nuisance function. |
| FU29 | OFF: having the function of changing to the indication number of the target floor earlier at multistage running; ON: having no such function. |
| FU31 | When FU31 mode is set as OFF, it is the mode without inching output; When FU31 mode is set as ON, it is the mode with inching output. |

**Table 5-6-2-4 Output Logic Table of Multi Speeds of KEB F4 Frequency inverter**

| speed \ Port | Y15 (J7-6) | Y14 (J7-5) | Y13 (J7-4) |
|---|---|---|---|
| Maintenance | 1 | 0 | 0 |
| Self Learning Speed /Leveling speed | 1 | 0 | 0 |
| Creeping | 0 | 1 | 0 |
| Low Speed (V4) | 1 | 1 | 0 |
| Medium Speed 1 (V3) | 1 | 1 | 0 |
| Medium Speed 2 (V2) | 1 | 0 | 1 |
| High Speed (V1) | 0 | 1 | 1 |
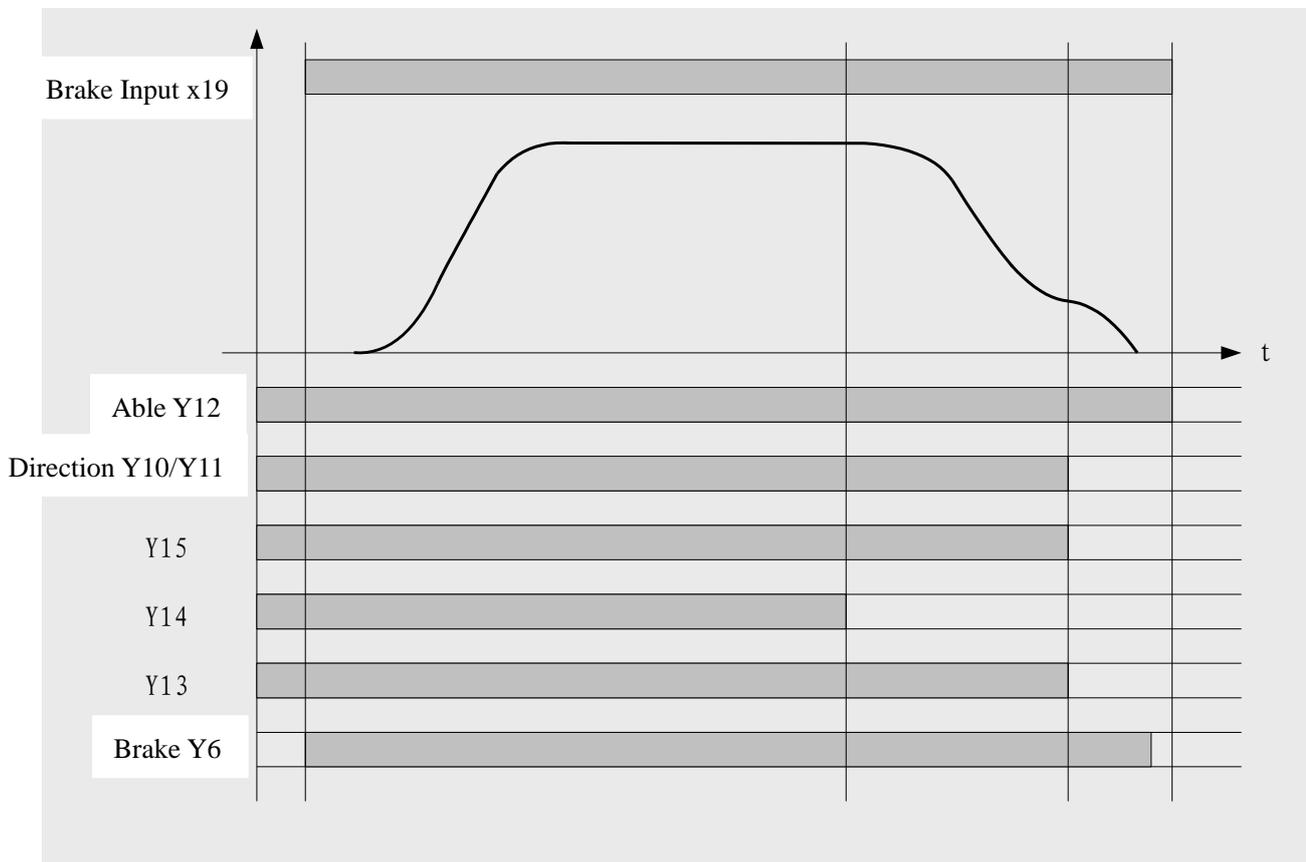


**Table 5-6-2-6 (8) The sequential diagram of main control boar output when FU12 and FU13 are set on**

## 5.7. The menu setting and operation of other parameters

### 5.7.1. Hoistway self learning

**1.** Before the normal run of an elevator, the hoistway self learning must be carried out;

**2.** The following requirements should be satisfied before carrying out the hoistway self learning:

（**1**）Upper/lower limit position switch, upper/lower station switch and corresponding bridge plate are installed,

all the wire connections are correct;

（2）Upper/lower door zone switch and door zone bridge plate for each floor is installed, all the wire connections are correct；

（3）The safety loop and door lock loop are available；

（4）Setting of system general parameters and operation parameter are finished.

（5）The maintenance can be performed while the elevator runs normally.

3. The hoistway self learning will begin if the elevator is under maintenance state and the car runs downwards to the position of lower limit position switch；

4. If the elevator is not located at low limit position, **To Down Limit** will be displayed, press slowly downward press button to run the elevator to the lower limit position；

5. If **Enter To Start** is displayed at the lower limit position，press **Enter** key, the elevator will automatically begin its self learning；

6. The self learning of elevator will stop at the upper limit position;

7. **Success** will be displayed if self learning is successful；

8. **Failure LER=#** will be displayed if self learning fails, please solve the problem according to the fault code prompt and continue the self learning (the significations of the fault code, please see the appendix);

9. If the user wants to quit self learning during the process of self learning, please press **Esc** key，**LER=15** will be displayed, and press **Esc** key to quit.
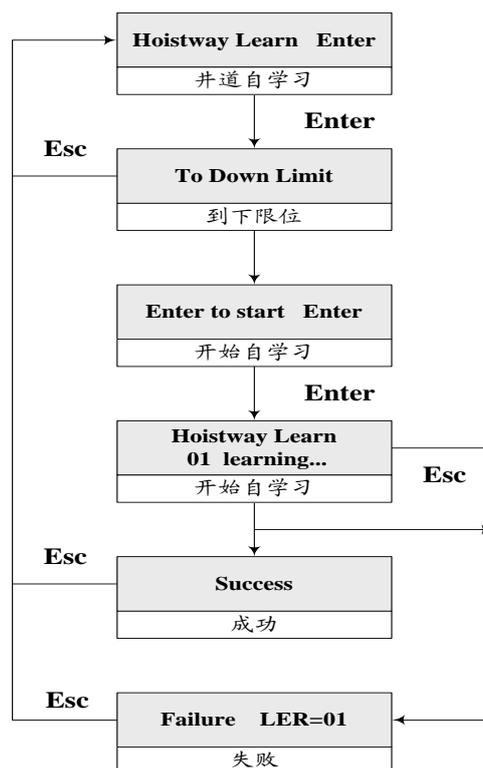


### 5.7.2. Parameter saving

After entering the parameter saving menu, select **Yes** and press **Enter** key, the system will automatically save the revised parameter. If saving is successful, **Success** is displayed, otherwise **Failure** is displayed. Please contact the factory if parameter saving fails.
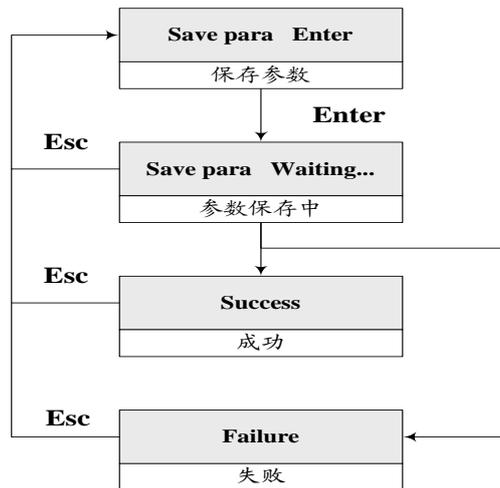
▲**Note：the parameter which could be set will take effect instantly after modification. But if the parameter is not saved after modification, after turning off the power supply of the system, the parameter will be restored to the original one.**

### 5.7.3. Password setting

This interface could be used for setting, modifying and saving the user's password.
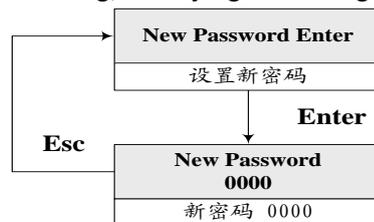
# Chapter 6 Debug and Operation of Bl3000 Serial Control System

## 6.1. Important notes

**1.** The users who have bought our products are expected to carefully read the manual and assembly equipment manual before the debug and operation, and carry out the debug and operation according to this manual, enclosed document and the content of assembly equipment manual to avoid the accidental losses;

**2.** Please carefully read and refer to the contents of *Setting of System Parameters* before the debug and operation of the system;

**3.** For on-site debug, please guarantee all the mechanical equipments especially the equipments and devices in the hoistway have been successfully installed (the equipment in the machine room depends on the condition of the machine room)；

**4.** For on-site debug, please guarantee all the equipments and device which should be installed and debugged before the system debug have been successfully installed and debugged；

**5.** The staff who is responsible for the on-site debug should get the confirmation of the installation and debug leader of mechanical system and other systems (installment) or some responsible staff；

**6.** Before debug, the staff who is responsible for the on-site debug should carefully check if the mechanical equipment related to the electric system debug and other devices or equipments have been successfully installed and debugged；

**7.** Before debug, the staff who is responsible for the on-site debug should carefully check and confirm that there is not any dangerous factor which will do harm to the people and equipment (including any potential and possible d dangerous factor)；

**8.** The staff that is responsible for the on-site debug should be qualified for debugging the elevator control system；

**9.** The debug environment should meet the environmental demand for the system debug and operation；

**10.** If joint debug of mechanical and electric systems is needed, then responsible staff who take charge of debug for mechanical system should be at the site；

**11.** If the content of this manual can not satisfy your demand, please immediately contact our company for instant assistance for avoiding the accidental losses during the debug and usage;

**12.** The staff that is responsible for the on-site debug should carefully check and confirm that the site is suitable for the debug of the control system.

## 6.2. Inspection before power-up

After the electric parts of the control system are installed, the electric parts must be inspected and the followings should be noted:

**1.** Check if the connections of all parts are correct according to the instruction and electric diagram.

**2.** Check if there is any relation between strong electricity and weak electricity part. Use ohmmeter of pointer type multimeter to check if the resistance among the different voltage circuits and the resistance to ground should be ∞.

**3.** Please carefully check if the power inlet wire of control cabinet and the connection wire of the motor are connected correctly to avoid burning the inverter after power-up.

**4.** Check if the connections of rotary encoder and the inverter are correct, and if connection coaxiality and electrical wiring of the rotary encoder and PM shaft are rational.

**5.** Check if the control cabinet case, motor case, car grounding wire and hall door grounding wire are reliably grounded to guarantee the people safety.

▲**Note: the cabinet case and motor case must be grounded at one point.**

**6.** To avoid damaging main board due to the inversion, please reconfirm if the connection and splicing position of power connecting terminal J4 of main board BL3000-STB.

▲**Note：The keyboard of main board is at the lower part of the LCD.**

**7.** Land the elevator in the middle leveling position.

**8.** Turn the electric lock switch to **ON** position.

## 6.3. Power-up and inspection

### 6.3.1. Confirmation before power-up

**1.** Confirm that all the air switches on the control cabinet have been turned off.

**2.** Confirm that the switch on the control cabinet is switched to the "Inspection" position, and the emergency stop switch has been pressed.

**3.** Confirm that the inspection switches of car top and car are switched to the "**Normal**" position.

**4.** Confirm that the terminal resistance of call board at the bottom floor has been connected.

**5.** Check the on-site main input-voltage: three-phase line voltage is **380±7% VAC**, interphase deviation should be less than **15VAC**. The voltage between every phase and N line should be **220±7%VAC**.

**6.** Confirm that the specification of inlet wire and main switch capacity both meet the design requirements.

### 6.3.2. Inspection after power-up

**1.** Turn on the main power switch, if the green light on the phase sequence relay **KXX** is lightened, it means the phase position is correct, otherwise, turn off the main power, switch the phases of any two inlet wires and then repeat the above inspection.

**2.** Check voltage of every terminal of the transformer **TC1** in the control cabinet, the value should be within **±7% of the** marked value of every terminal. If the value exceeds the scope, find out the reason and correct it.

**3.** If the above inspections are normal, the following steps can be carried out:

（**1**）Turn on **F2**　　Voltage between terminal **100** and **101** should be **110±7%VAC.**
　　　　　　　　　　　Voltage between terminal **103** and **102** should be **110±7%VDC.**

（**2**）Turn on **F3**　　Voltage between terminal 2**00** and **201** should be **220±7%VAC.**

（**3**）After the main board is powered on, firstly observe if the main menu on the LCD is correct, such as the elevator state, fault state, door lock state, current floor and running speed, to judge the operation and display of the main board and power supply of 5V, 24V is normal.
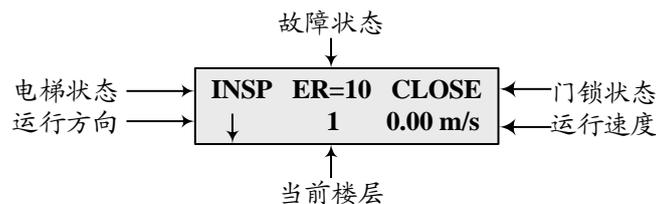


故障状态　fault state

电梯状态　elevator state

运行方向　running direction

门锁状态　door lock state

运行速度 running speed

当前楼层 current floor

（**4**）See the following diagram for voltage of every terminal of switch power supply :

**Diagram 6-3-2 (4) Voltage of every terminal of switch power supply**

| Terminal | L～ N | 5V～ G | 24V～ G |
|---|---|---|---|
| Voltage | 220±7%VAC | 5.0±0.1VDC | 24.0±0.3VDC |

（**5**）Reset the emergency stop switch of the control cabinet, and the relay **KJT** and contactor **KMC** should pull in, the inverter is powered on to work.

（**6**）If all parts above are checked normal, then check the following items:

◆ Check if the door lock circuit is normal.

◆ Check if the signal of door zone and signal of upper/ lower limit are normal.

◆ Check if the electric lock is normal: set the automatic elevator turn-on/off time in the setting parameters as zero, and turn the electric lock to ON position, the elevator state displayed on the LCD should be **INSP** at this time, if turn to **OFF** position, **STOP** should be displayed.

◆ Check if the door open/close system works normally, if not, please make some relevant inspections.

## 6.4. Setting of system parameters

Set the system parameters according to the actual scene condition; please see **Chapter 5 Setting of System Parameters** for the specific parameter definition and setting methods. Additionally, when setting system parameters, please pay attention to the following points**:**

**1.** Before carrying out lower speed debug, please correctly set parameters of the equipped inverter;

**2.** Please see the **Appendixes** for specific parameters setting of different types of inverters;

**3.** The setting of the motor parameters is recommended to be determined through self-learning function of inverter to motor. See the instruction of the inverter for the methods of self-learning of the motor parameters.

## 6.5. Trial run at lower speed

### 6.5.1. Maintenance operation of machine room

**1.** The things that should be confirmed before maintenance operation of the machine room:.

（**1**）The maintenance switch of the control cabinet is switched to **Maintenance** position, the maintenance switches of car top and car are switched to **Normal** position.

（**2**）Safety circuit and door lock circuit work normally, **remember not to short-circuit the door interlock**.

（**3**）The installation and connection of the encoder are normal.

（**4**）When powered on, **KJT** and **KMB** relays and **KMC** contactor in the control cabinet pull in, the powered inverter displays normally and check if the parameters setting are correct, the elevator state displayed on the LCD is **INSP**.

（**5**）Connect the PM brake with the control cabinet wiring.

**2.** Maintenance operation of the machine room

When the conditions of maintenance operation of the machine room are satisfied, press the slowly up/down button, and the elevator shall run at the set maintenance speed.

（**1**）Observe feedback speed and direction of the motor the inverter displays. The direction is positive when the elevator runs upwards; and the direction is negative when the elevator runs downwards.

（**2**）Press the slowly up (down) button, if the inverter displays that feedback rotary speed of the motor is

unstable or the deviation of the given value is relatively big, then exchange phase **A** and **B** of the rotary encoder after power is off, and power the elevator on again and carry out maintenance operation.

（**3**）If the running speed of an elevator is stable, but the running direction is opposite to that the button indicated, then exchange any two phase lines between the inverter and the motor after power-off, and meanwhile exchange phase **A** and **B** of the encoder and then power the elevator on to carry out maintenance operation again.

（**4**）If the running direction and feedback of the elevator are correct, but the system gives **Er04** (the running direction is wrong) protection, then exchange phase **A** and **B** of the encoder input terminal on the main board of the control cabinet, power the elevator on again to carry out maintenance operation.

### 6.5.2. Maintenance operation of car top and car

If the maintenance operation of the machine room is normal, the maintenance operation of car top and car can be carried out. If up and down direction the direction buttons showed are opposite to the actual run direction of the elevator in maintenance operation of car top and car, then check the button circuit of the corresponding maintenance direction, do not make any more change to the circuit of the control cabinet.

## 6.6. Hoistway self-learning

Hoistway self-learning operation means that the elevator runs at the self-learning speed and measure the position of every floor and every switch in the hoistway. The floor position is the base for normal start-up and brake of elevator and the base for floor display. So before letting the car run at a high speed, the hoistway self-learning operation must be carried out. The steps of hoistway self-learning are as follows:

**1.** Confirm that the elevator meets the demand of safe operation;

**2.** The installation and wiring of every switch in the hoistway are correct, the connection of traveling cable and call cable are both correct, then set the call and display address;

**3.** Let the elevator enter into the maintenance state，run the car downwards at a lower speed to the screw-down limit;

**4.** Enter into the self-learning menu on the LCD, and operate according to prompt of the menu;

**5.** The elevator runs upwards at the maintenance speed and begin its self-learning, **Learning…..** will be displayed on the LCD, the elevator runs upwards towards to the upper limit and stop, and **Success** will be displayed.。

**6.** The result of self-learning can be observed in the "hoistway switch position" and " landing position" of supervision menu, the unit of the data is meter (**m**) .

**7.** In the process of the self-learning, if there are any abnormal phenomena in the control system, the self-learning will be stopped halfway, and some fault signals will be shown, see the Appendixes for the fault list.

      b)  **Notice：When the self-learning stops, Success displayed on the LCD is the only signal for successful finish of self-learning.　(please see the content of 5.7.1)**

## 6.7. Trail run at high speed

If the hoistway self-learning is confirmed to be correct, then the trial run at high speed can be carried out. The steps are as follows:

**1.** Set the elevator in the attendant state.

**2.** Supervise the floor selection interface in the menu through LCD, select the floor the elevator runs to, the trial for single floor, double floors and multi floors and whole trip can be separately carried out.

**3.** Confirm the elevator can normally start up, accelerate, decelerate to zero speed, level and stop in the above areas.

**4.** If the running is abnormal, please carefully check if there is any mistake in the parameter setting of main board and the inverter.

## 6.8. Comfort adjustment of elevator

If the comfort sense and leveling precision of the elevator is not perfect, firstly check the mechanical condition of the system: for example the clearance of the guide shoes, lubrication and uniformity of the tightness of the steel rope and the position of rope head splint which are the parts directly affect the comfort sense. The control part can be adjusted, only when there is not any problem with the mechanical parts after the check.

The inverter controls the motor running according to given start-up and brake curves, so the shape of given start-up and brake curves, tracing closeness to the curves of the feedback speed of the motor controlled by inverter and the sequential logic of the control signal to inverter by main board can directly affect the comfort when the elevator is running.

### 6.8.1. Adjustment of startup and brake curves



图 6-8-1 运行曲线图示
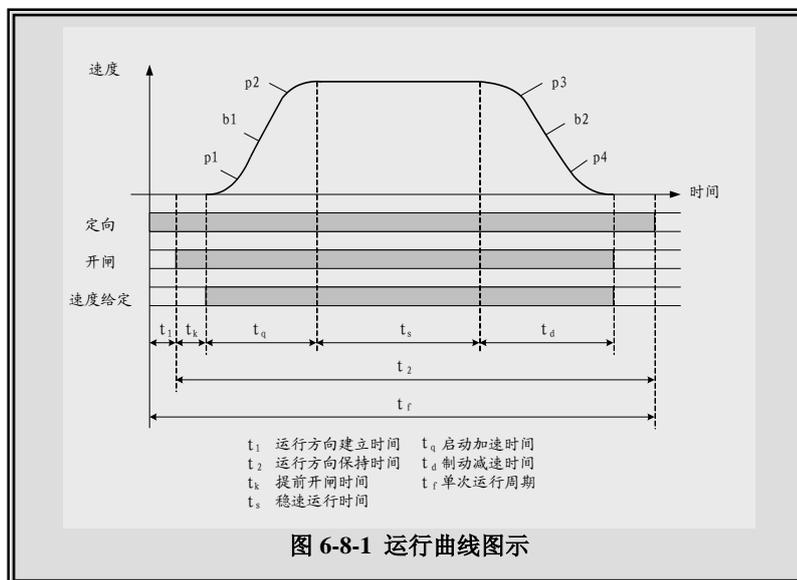
速度  speed
定向  direction
开闸  brake
速度给定  speed reference
时间  time
运行方向建立时间  setup time of the running direction
运行方向保持时间  run time of the running direction
提前开闸时间  break on time
稳速运行时间  running time of the stable speed
启动加速时间  start-up and acceleration time
制动减速时间  brake and deceleration time
单次运行周期  single running period
图 6-8-1 运行曲线图示  **Diagram 6-8-1 Diagram of the Running Curve**


**1. The S shape curve in the starting part will be adjusted by the following three parameters:**

（1）**P1**: At the beginning of the start, the acceleration increases, which means the acceleration change rate of

curve, the smaller this value is, the slower the start will be, and the better the stability will be.

（2）**b1:** The acceleration of the startup segment, which means the speed change rate of the curve, the smaller this value is, the slower the start will be, and the better the stability will be.

（3）**P2**: the acceleration decreases at the ending segment of start-up, which means the acceleration change rate of the curve, the smaller this value is, the slower the ending segment of start-up will be, and the better the stability will be.

**2. The S shape curve in the braking part will be adjusted by the following three parameters：**

（1）**P3**: At the beginning of the brake, the deceleration increases, which means the deceleration change rate of the curve, the smaller this value is, the slower the brake will be, and the better the stability will be.

（2）**b2:** The acceleration of the brake segment, which means the speed change rate of the curve, the smaller this value is, the slower the braking will be, and the better the stability will be.

（3）**P4:** the deceleration of the ending segment of brake decreases, which means the deceleration change rate of the curve, the smaller this value is, the slower the ending segment of brake will be, and the better the stability will be.

Note: When carrying out the on-site debug, please adjust the above six parameters properly to obtain the best elevator running curve on the premise of ensuring the running efficiency of the elevator.

### 6.8.2. Trailing adjustment of running curve

The inverter must control motor and make its feedback speed strictly trace the given curve change to obtain the expected comfort.

The inverter will set up a mathematical model according to the motor parameters the user inputs and control the motor start-up and brake with this model, so the user must precisely input motor parameters. (The self-learning of motor parameters is recommended.)

The parameters of proportional gain **C5-01** (Yaskawa inverter) and integration gain **C5-02** (Yaskawa inverter) of speed loop will affect the curve tracing. Generally, increase the proportional gain will improve the dynamic response of the system operation and increase the quickness of the tracing. But the overlarge proportional gain will cause the high frequency vibration of the system and loud noise of the motor. Increase the integral gain will improve the ability of anti-disturbance and tracing of the system and the leveling precision, but the overlarge integral gain will cause system vibration, speed overshooting and wavelike shake in running.

Generally, first adjust proportional gain, increase the value as far as possible on the premise of ensuring system stability, and then adjust the integral gain and make the system have quick response and less overshooting.

### 6.8.3. Adjustment of controlling time sequence in elevator running

See Diagram **6-8**-1 for the elevator time sequence diagram of the system, the internal programs of the main board are implemented according to the controlling time sequence the diagram shows, the parameters which the user can set are the brake time and zero speed setting.

**1.** The adjustment of prior break time

It is the delay time from inputting the break command to activating the curve to give out the command; the parameter is set for suiting the action time of the PM break. The value will greatly affect the comfort at the start point of the elevator. If the value is too small, the elevator will start with brake. If it is too big, the elevator will

slide during start-up.

**2.** Zero Speed Setting

The parameter set the zero speed threshold of the system. The main board takes this setting value to judge the moment the car should brake and stop. If this value is too big, the elevator will brake with speed. If it is too small, the door will delay to open when the car lands. Generally the value is **5 r/m**.

### 6.8.4. Adjustment of multi-speed mode

When some brands of inverters are used (such as Fuji G11UD) and command for multi given speed is needed, set the parameter as **Yes**, the simulation given value as **No** and the value of ex-work as **No**.

```
        ┌─────────────────────────────┐
   ┌───→│ Multi Speed Mode  Enter     │
   │    ├─────────────────────────────┤
   │    │         多段速度方式         │
   │    └─────────────────────────────┘
   │                  │ Enter
   │                  ↓
   │    ┌─────────────────────────────┐
  Esc   │      Multi Speed Mode       │
   │    │         Mode：Yes           │
   │    ├─────────────────────────────┤
   │    │         多段速度给定         │
   └────└─────────────────────────────┘
```
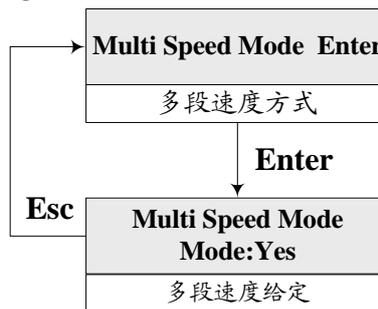
多段速度方式  multi-speed mode
多段速度给定  multi-speed reference

### 1. Setting of multi speed value

When the multi speed mode is set as **Yes**, multi speed values and throw-over distance must be set, see the following list for the specific values (for reference only):

**List 6-8-4-1Setting list of multi speed values and throw-over distance**

| Elevator Speed / Setting value Parameter | 1.0m/s | 1.5～1.75m/s | 2.0m/s | 2.5m/s |
|---|---|---|---|---|
| V1 | 1m/s | 1.5～1.75m/s | 2.0m/s | 2.5m/s |
| V2 | 0 | 1.0m/s | 1.6m/s | 2.0m/s |
| V3 | 0 | 0 | 1.0m/s | 1.6m/s |
| V4 | 0 | 0 | 0 | 1m/s |
| S1 | 1.3m | 2.4m | 4.2m | 6.5m |
| S2 | 0 | 1.3m | 2.4m | 4.2m |
| S3 | 0 | 0 | 1.3m | 2.4m |
| S4 | 0 | 0 | 0 | 1.3m |

When setting the multi speed values, set V1 as the corresponding speed value of the highest speed section，and set **V4** as the corresponding speed value of the lowest speed section, the unit is **m/s**. Once the speed value is set, LCD interface will display the corresponding motor rotary value, the unit is rpm.

```
        ┌─────────────────────────────┐
   ┌───▶│   Multi Speed Give Enter    │
   │    ├─────────────────────────────┤
   │    │       多段速度值给定          │
   │    └─────────────────────────────┘
   │                  │ Enter
   │  Esc             ▼
   │    ┌─────────────────────────────┐
   ├────│   Multi Speed Give          │ ◀── 折算的电机转速
   │    │   V1: 1.6 m/s <1350r >      │
   │    └─────────────────────────────┘
   │            ▲        │ Enter
   │       电梯速度       ▼
   │  Esc ┌─────────────────────────────┐
   ├──────│   Multi Speed Give          │
   │      │   V2: 0.96 m/s < 810r >     │
   │      └─────────────────────────────┘
   │                  │ Enter
   │  Esc             ▼
   │    ┌─────────────────────────────┐
   ├────│   Multi Speed Give          │
   │    │   V3: 0.00 m/s < 000r >     │
   │    └─────────────────────────────┘
   │                  │ Enter
   │  Esc             ▼
   │    ┌─────────────────────────────┐
   └────│   Multi Speed Give          │
        │   V4: 0.00 m/s < 000r >     │
        └─────────────────────────────┘
```
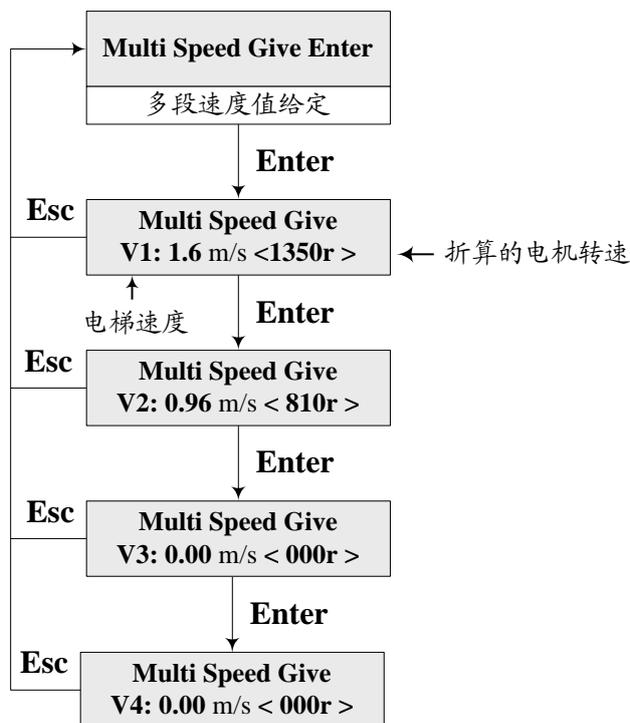
多段速度值给定　multi speeds values reference
折算的电机转速　commuted motor rotary speed
电梯速度　elevator speed

c)    **Note: The setting of V1～V4 is used for the internal calculation of the system，changing these parameters will not change the running speed of the elevator. The user must use this displayed value to set the multi speed of corresponding given speed value of the inverter, otherwise the elevator can not run normally.**

## 2. Output logic of multi speed command

Multi speed output instruction is the combination of three output - **Y15, Y14, Y13**, and their logics are as follows:

Table 6-8-4-2 Logic list of multi speed output command

| Ports / Speed | Y15 (J7-6) | Y14 (J7-5) | Y13 (J7-4) |
|---|---|---|---|
| Maintenance (no inching)/self-learning | 0 | 1 | 0 |
| Rerun to level floor | 0 | 0 | 1 |
| Creep | 0 | 1 | 1 |
| Low speed (V4) | 1 | 0 | 0 |
| Medium speed1 (V3) | 1 | 0 | 1 |
| Medium speed 2 (V2) | 1 | 1 | 0 |
| High speed (V1) | 1 | 1 | 1 |

## 3. The examples of multi speed output

（1）**Maintenance (no inching)    Diagram 6-8-4-1**

（2）**Maintenance ( inching, such as Yaskawa inverter) Diagram 6-8-4-2**

When **FU31** mode is set as **ON**, then output mode is inching output, and the maintenance speed is only controlled by **Y1** output.

**（3）Self-learning and creeping for leveling (Diagram 6-8-4-3)**

**（4）Home landing return for safety** (the same as the creeping for leveling, the position entering landing is the lowest landing)

**（5）High speed running diagram (6-8-4-4)**



图 6-8-4-1 检修（无点动）运行曲线图示　　　图 6-8-4-2 检修（有点动 FU31=ON）运行曲线图示

图 6-8-4-3 自学习或爬行找平层运行曲线图示　　　图 6-8-4-4 高速运行曲线图示
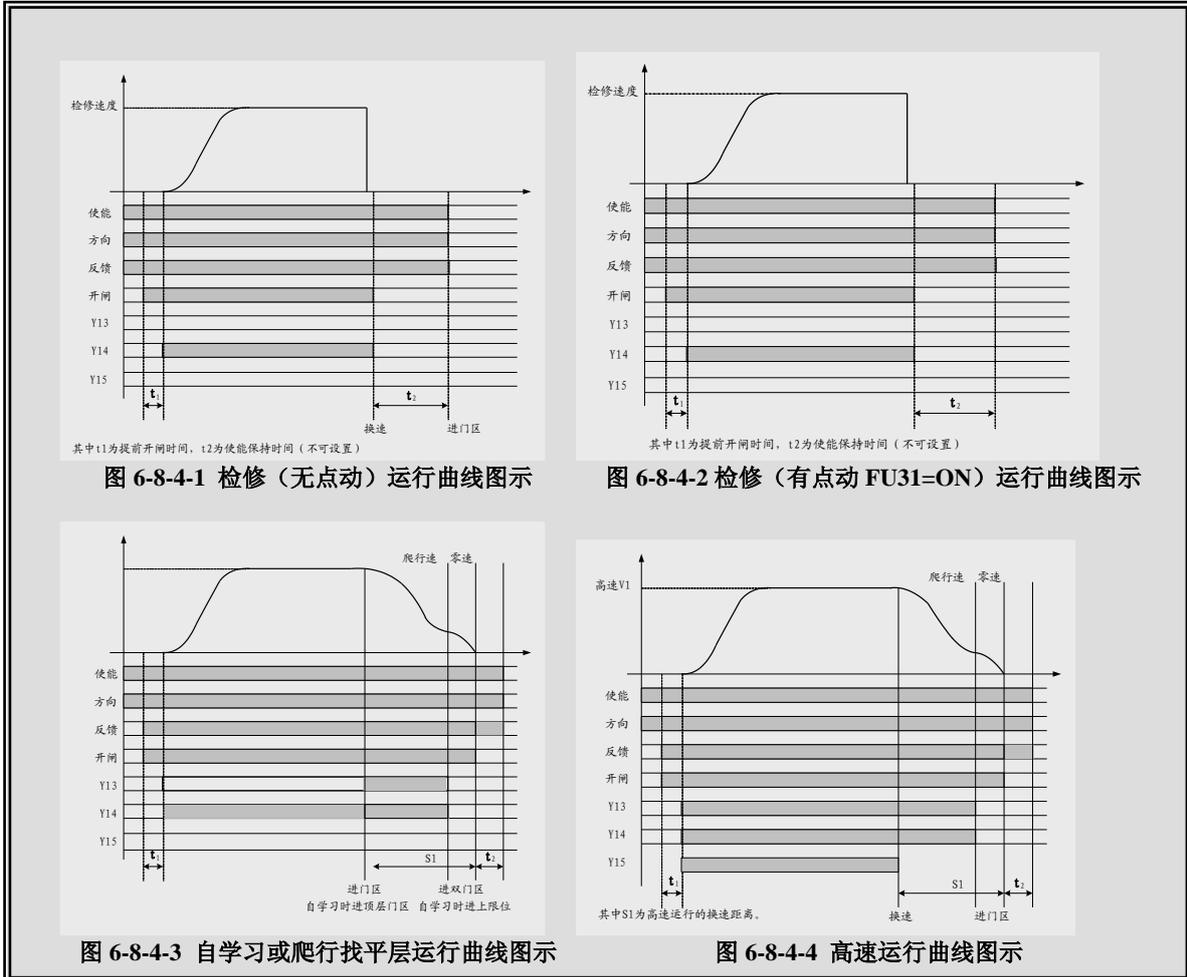
检修速度　Inspection speed

方向　direction

反馈　feedback

开闸　brake

换速　throw-over

进门区　entrance door area

其中 t1 为提前开闸时间，t2 为使能保持时间（不可设置）

t1 is prior break time and t2 is the available holding time (can't be set)

图 6-8-4-1 检修（无点动）运行曲线图示　Diagram 6-8-4-1 Curve diagram of maintenance (no inching) running

图 6-8-4-2 检修（有点动）运行曲线图示 Diagram 6-8-4-2 Curve diagram of maintenance ( inching included) running

使能　　enable

方向　direction

反馈 feedback

开闸　break

爬行速 creep speed

零速 zero speed

进门区 entering landing

进双门区 entering double landings

自学习时进顶层门区 entering the top landing during self-learning

自学习时进上限位 enter the top limit during self-learning

图 6-8-4-3 自学习或爬行找平层运行曲线图示 Diagram 6-8-4-3 Curve diagram of self-learning or creep for leveling running

高速 high speed

其中 S1 为高速运行的换速距离 S1 is the throw-over distance in high speed running

图 6-8-4-4 高速运行曲线图示 Diagram 6-8-4-4 High-speed Running Curve diagram

（6）**Medium Speed Running (Diagram 6-8-4-5)**

▲**Notes：**

◆ When ex-works, the given point of zero (the output of **Y15, Y14 and Y13** is **0**) speed is the position of single landing;

◆ If entering double landings needs to be given at zero speed segment, please contact our company and our engineer will help for the setting;
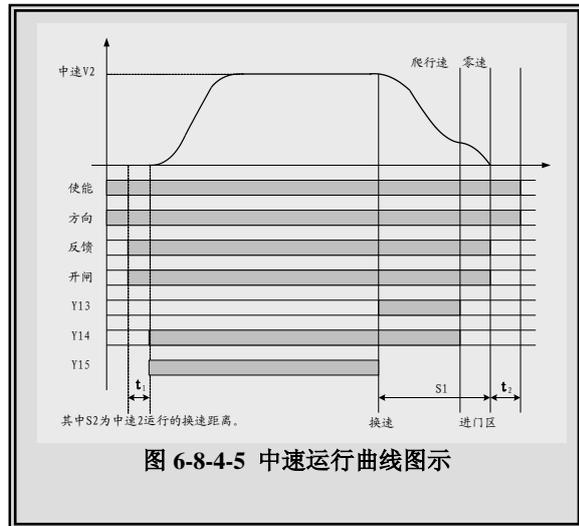


图 6-8-4-5 中速运行曲线图示

中速 medium speed

使能 enable

方向 direction

反馈 feedback

开闸 brake

其中 S2 为中速运行 2 的换速距离 S2 is the throw-over distance of medium speed running 2

图 6-8-4-5 中速运行曲线图示 Diagram 6-8-4-5 Curve diagram of the medium speed running

换速 throw-over

进门区 entering landing

爬行速 creep speed

零速 zero speed

## 6.9. Adjustment of leveling precision

Adjust the leveling precision after the adjustment of comfort sense.

**1.** The basic conditions to guarantee the leveling of the elevator

（1）The accurate leveling depends on the exact installation position of landing sensor and bridge plate, all the things should be done when the elevator is installed;

（2）The length of every landing bridge plate should be exactly the same；

（3）The bracket should be firm;；

（4）The installation position of the bridge plate must be correct. When the car is leveling, the central point of

bridge plate should coincide with that of distance between the sensors of the two landings (see Diagram **4-3-3-1**), or else the leveling point of this floor will deviate, namely the car will higher or lower than leveling point both in upward and downward direction.

（5）If the magnetic switch is adopted, then the enough depth the bridge plate is inserted should be guaranteed during installation, or else it will affect the action time of the inductive switch and cause the higher position in upward direction or lower position in downward direction in running.

（6）In order to ensure the leveling, the system requires a short creep of the elevator before stop;

（7）During the actual adjustment, firstly adjust one of medium floors till it is correctly leveled. And then adjust other floors on the basis of this parameter.

（8）Through the curve selection and adjustment of proportional and integral gain in the previous paragraph, repetitiveness of stop position in meddle floors whatever the running directions should be ensured (namely the error of stop position should be **≤±2～3mm**).

**2.** Adjustment of leveling precision under multi speed mode

（1）No creep or the creep time is too long

The system requires the elevator enter into the creep state after the deceleration, this is the basic condition for the leveling of the elevator. If there is no creep, it means that the deceleration curve is too slight; if the creep time is too long, it means the deceleration curve is too steep. Adjust the deceleration curve and make it a proper one.

（2）Low position in upward direction, high in downward direction or high in upward direction, low in downward direction

When low position in upward direction or high position in downward direction appears, it means the creep speed is low; when high position in upward direction and low position in downward direction appears, it means the creep speed is high. And the speed should be adjusted.

（3）Low position in upward direction, low position in downward direction or high position in upward direction, high position in downward direction

When low position in upward direction, low position in downward direction or high position in upward direction, high position in downward direction appear after car stops, it means that the position of landing bridge plate deviates, please adjust the position.

（4）The wrong installation position of the upper and lower terminal

The wrong installation position of the upper and lower terminal will affect the leveling precision of the elevator at two sides. Taking the upper terminal as an example, the adjustment steps of the terminal position are as follows:

◆ Install the terminal switch to the position which is beyond the throw-over distance;

◆ The elevator quickly runs to the terminal, and stops after throw-over, then unleveling appears;

◆ Immediately switch the system into the maintenance state;

◆ Measure the distance between the elevator and the leveling, which is the distance that the upper terminal needs to be lifted upwards.

The lower terminal could be adjusted in the similar way.

**3.** Leveling precision adjustment under simulative given mode

（1）The repeatability confirmation of the stop position

Through the curve selection and adjustment of proportional and integral gain in the previous paragraph, repeatability of stop position should be ensured during car stop in middle floors whatever the running direction of the elevator (namely the error of every stop position should be **≤ ±2～3mm**).

（**2**）The adjustment of landing bridge plate

◆ The elevator lands floor by floor, measure and record deviation value △ **S** between car sill and landing door sill when the car stops at every floor (if the car sill is higher than the landing door sill, the value is positive, or else it will be negative).

◆ Adjust the position of landing bridge plate floor by floor, if △ **S＞0**, move downwards the landing bridge plate by △ **S**; If △ **S＜0**，move upwards the landing bridge plate by △ **S**.

◆ After adjusting the landing bridge plate, hoistway self-learning must be restarted.

◆ Recheck the leveling, if the leveling precision can not meet the requirement, then repeat steps from **(1)** to **(3)** .

（**3**）Adjust the parameter menu

If the position of elevator stop is repeatable, but for the same floor, the upper and lower leveling are not at the same position, if the case is high position in upward direction, low position in downward direction or low position in upward, high position in downward direction, then adjustment can be made through leveling adjustment parameter menu (**Leveling Adj**) in the menu of running parameters. The default value of this parameter is **50mm**，if the case is high position in upward direction and low position in downward direction, then decrease this value, whereas increase it. The adjustment amount is half of the leveling deviation value, for example, if the total deviation value of high position in upward direction and low position in downward is **20mm**，reduce it to **10mm**.

## 6.10. Confirmation of installation position of terminal

The signals of upper and lower terminals are the adjustment signals of forced throw-over of the elevator and floor position, which should be installed at car action position which is 2.5m from the leveling positions of the top(bottom) floor. The confirmation method are as follows:

**1.** Make the elevator in the maintenance state;

**2.** Set the maintenance speed as **0.3m/s**, run the elevator upwards (downwards);

**3.** Stop when the upper (lower) terminal switch works;

**4.** The distance between car sill and landing door sill should be **2.5±0.1m**.

# Chapter 7 BL3000 Serial Control System Failures Analysis

## 7.1 Conditions for maintenance operation

◆ Under the state of maintenance, no matter whether the communication is normal or not, the operation condition could be satisfied as long as the running state of the elevator (door lock, brake, open/close door) is normal, and the maintenance control can be carried out.

◆ When the input signal **X1 (X2)** is valid, the main control computer board will output **Y10 (Y11) and Y12**;

◆ The rated voltage of simulative signals are **J8-9～J8-10 > 2V**, and the **Y14** is valid under the mode of multi speed;

◆ The converter outputs operating signal, which makes the input signal **X19** of main board valid and the motion of contactor KDY normal. Otherwise, please note:

◆ Whether the output signal of the door open/close of main board is normal;

◆ Whether the input signal of converter is normal and whether the parameter setting is correct.

## 7.2 The low running speed and the heavy current during maintenance operation

The occurrence of such phenomenon could be possibly caused by following reasons:

1. Phase sequence of the encoder is reversely connected;
2. The encoder is abnormal and the pulse is lost;
3. The setting of pulse number of encoder is wrong;
4. The setting of poles of electric motor is wrong.

## 7.3 The speed displayed by the main board is incorrect.

The feedback speed of converter is normal and the current is normal, but the feedback speed of main board is abnormal, please notice the phase-sequence or frequency of the input pulse of the main board.

## 7.4 Check on the abnormity of communication

Under the normal situation, on the main menu displayed by the LCD of the main board, press > to enter the interface of communication state:
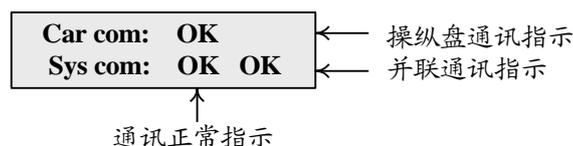


操纵盘通讯指示　　Indication of control board communication
并联通讯指示　　　Indication of parallel communication
通讯正常指示　　　Indication of normal communication

Otherwise, the following problems may occur:

1. The LCD displays **Car Com ER/0~256**, which indicates that the communication between the car board and the main board is abnormal. Please check if the communication wire in the traveling cable is short-circuited, and the communication indicator of the car board blinks.

2. The LCD displays **Sys Com ER/0～256**, which indicates that the communication is abnormal while the main board receiving sent public data from a call or the display board and car board. Please check whether the switch-in inserter of terminating resistance on the lowest call board is inserted or not.

3. The main board has failure in sending out public data; probably because that the communication cable is short-circuited to the land or to N line.

4. Some call or display board failures may be checked by monitor menu **Call test** to find out the relevant floors with failures, If the address setting is done but not displayed, it may be caused by wrong setting, the break of communication wire or the failure of call or display board;

5.The sending indicator TXO of the main board doesn't blink, indicating that the communication of the main board is abnormal; if the power is cut off and reset and the sending indicator blinks normally, please observe and deal with the situation according to the above four items, otherwise the interface chip may be damaged.

## 7.5 Abnormity of switch power supply (5V/24V)

1. Power supply indicator of the main board is dark, and all indicators inside the board are dark. Please disconnect the well channel and traveling cable to diagnose, it may be caused by the overload of **5V/24V** power supply or short circuit to **GND2**;

2. The main board resets during operation of the elevator (resulting in the elevator's sudden stop), and then recovers to normal state, which may be caused by virtual connection of **GND2** to Line **N** or the **land**, which brings interference to the power supply of switch.

## 7.6 Check on no output signal of direction and brake

When the contactor of door lock closes, KDY contactor (the contactor between the converter and the electric motor) closes, there's input signal of operation, but no output of direction or brake. The occurrence of such phenomenon results from the abnormal action of door lock contactor, and the analysis is as below:

1.  Door locking failure

In the process of debugging, when the hall door and car door are not rightly installed, and the debugging personnel try out the door locking operation, such phenomenon may occur. Please pay attention that the output signal of door closing/opening should be in consistency with the action of door lock contactor.

▲Note: The signal of short-circuit of door lock may fit for maintenance operation rather than normal operation.

2. Door opening failure

In the event of door opening failure, when the car uses dot-matrix display board, usually the character "U" will be displayed. The reference of solutions are as follows:

◆ Set the elevator to be under the state of maintenance, input the door open command (given by the car exit button or the LCD menu), observe whether there's output of door open signal (Y4), If there's an output of door open signal, please observe if the door open relay is closed (in case that there's door open relay), if the door open output is normal, but the door doesn't open. Please check if the connection between the door open signal of door operator and the cabinet in machine room is correct, or check if the door operator is normal.

◆ Under the state of maintenance, when there's input of door open command, but no door open output (Y4) , check if limit input of door open and close is correct. Observe U07 (door open limit), (and whether the back door U05 is "■"under the rear opening mode).

◆ Under the normal condition, the U06 will be valid when the car door closes to its designated position (the LCD display changes from "□" to "■"), U07 becomes invalid (the LCD display changes from "■" to "□"); when the car door opens to the designated position, U07 becomes valid and U06 becomes invalid; when the car door opens to the middle position, both U06 and U07 will become invalid at the same time.

◆ If the observation results do not conform to the above situation, it is probably that the installation of door open and close limit switch is incorrect or the applied type of touch point is incorrect. If U06 is invalid and U07 is valid when the car door closes to its designated position, and U06 is valid and U07 is invalid when the car door opens to its designated position, the problem should be reversal connection, please correct the connection; if both U06 and U07 are valid when the car door opens to the middle position, the problem may result from the unmatched setting of adopted input type of normally opened or closed point, then please change the type of contact or modify the setting of valid electrical level at the input port. (Please modify the input type of U04~U07 in the menu of Input Type .)

◆ When the elevator is rear opening, please notice that whether the setting of door open and close is reverse, and whether the touch panel, screen signal is corresponding, please observe the state of I/O Car Data in reference to the above operations. Note: Please confirm the front/rear door respectively.

## 7.7 Door closing failure

Under the normal operational state, the door of elevator opens and then closes automatically. If the door is not closed in right way, the door will open again and repeat for several times, the methods for check and diagnosis are as follows:

1. Check whether the door close is obstructed;
2. Confirm whether the travel route of door is too long;
3. If the door can not be closed in right way within the system operational time of door open and close, please adjust the Door Run Time.
4. If the problem is possibly caused by incorrect door open and close limit and type of contact, please refer to the "**open door failure**" to check and solve the problem.
5. If the door open and close door is normal under the maintenance state, but the door can not be closed when the elevator enters into the normal state. At this time, please check the switch of safety edge or the input type of the switch. Observe the signal of U18 safety edge switch (the rear door of rear opening, see U17) in the I/O Car Data menu, if the safety edge or the screen is shaded, U18 should be valid (the LCD display changes from "□" to "■"), if the safety edge is unlocked, U18 should be invalid (the LCD display changes from "■" to "□"). Where the situation is contrary to that above, please change the type of contact or adjust the setting of valid electrical level at the input port (setting of Input Type of U17~U18 in the menu of Input Type). If the U18 is valid all the time, please check the connection between the input port of safety edge of car board and the switch of safety edge. If the inputs of safety edges are correct, please confirm if the overload U15 is valid (overloaded and opened).

## 7.8 Malfunction of elevator arisen from wrong setting of output of switching volume of load detecting device

1. If the system is installed with load detecting device, and the state of load detecting is output to the car board, namely J9-8 light load input, J9-6 full load input, J9-5 overload input, so please confirm the type of connection point of output of switching volume, for example, for the normally opened contact, please set the input type of U13, U14 and U15 as ON in Input Type, (Whereas, for the normally closed contact, please set it as OFF).Please observe whether the U13,U14,U15 in the car signal of I/O Car Data is correctly input

according to the load situation.

2. If the number of passengers in the car is relatively large, and the selected numbers are automatically canceled when there are more than three selections, it may be caused by the incorrect input under light load;

3. When the elevator is empty and it doesn't response to the call, this phenomenon is probably caused by the consistent validity of full load input;

4. If the phenomenon of failure of door closing appears, it is probably caused by the consistent validity of overload input.

## 7.9 The running direction of elevator is contrary to the instruction (ER04)

1.If the two pulses of the main board A and B is adversely connected, namely, the feedback speed displayed by main board is negative when the elevator goes up, and the feedback speed is positive when the elevator goes down, then exchange two phases of input pulses of A and B in the main board.

2. If the running direction of elevator is contrary to the designated direction, please change the phase of eclectic motor and the A, B phase sequence of encoder.

3. If the directions of feedback speed displayed keep unchanged whatever actual running direction of the elevator, this may be caused by the loss of phase of A, B input pulses. If the feedback speed is positive whatever actual running direction of the elevator, the phase B is probably lost. The solution is as below:

◆ Firstly cancel the A phase of impulse input from the main board, and there should be no feedback speed display during the operation. Then cancel the input of phase B, connect the input of phase A to phase B;

◆ When the elevator starts again, if there's display of feedback speed, then it indicates that there are some problems between frequency divider of inverter and phase B of main board..

◆ If input of phase A is connected to phase B and there's still no display of feedback speed, it is probably due to the fact that the circuit of phase B input of main board is damaged, please change the main board and try again;

4. If the display of feedback speed on main board is always negative whatever actual running direction of the elevator, the judging method is contrary to above content.

## 7.10 Failure of braking on (ER05)

The main board sends out the instruction of braking on Y6 and receives no feedback signal from brake monitoring switch, or the contact stickiness is detected after the brake relay releases, under the above conditions, signal of ER05 failure will be sent out. If the elevator sometimes has pre-protection before start, but return to normal state when start again; or there is record of many ER05 failure, please check if the feedback contact of brake contactor is badly contacted, please replace the brake contactor.

## 7.11 Small number of pulses or no pulse input (ER07)

The main board will receive the pulse signals from inverter (the frequency divider of inverter) or encoder during the operation of elevator, if number of pulses is too little or no pulse input is detected, the possible reasons might be as follows:

1. The connection between port of pulse input and frequency divider is cut off;

2. If the source of pulse signal is of the long line drive type, then A, B phase may be connected in a wrong way (such as A and B or –A and -B are matched in a wrong way);

3. If the connection is correct, please use multimeter to check the voltage for diagnosis;

◆ When using the push-pull pulse source, the voltage between J9-1 (the positive test pen) and J9-5of

electric motor of low rotating speed should be around **+6V,** so does the voltage between J9-1 and J9-6**.**

◆ When using the line driving pulse source, the voltage between J9-7(the positive test pen) and J9-8 should be **2.5V or -2.5V**, so does the voltage between J9-9(the positive test pen) and J9-10**.**

◆ The above voltage is the basis for judging reasons of the failure: if the voltage is correct, the failure happens in the main board, otherwise the failure happens in the frequency divider (encoder).

## 7.12 The output of KDY contactor is in inconformity to the feedback result ER09)

If such phenomenon occurs, there are following possible reasons:
1. KDY (contactor) sticks;
2. KDY doesn't switch on when the main board outputs Y9. The connection breaks or the KDY contactor is damaged;
3. KDY feedback contact is badly contacted.

## 7.13 The mistake of building floor counter (ER14)

1. The input interference of encoder is excessive, and the connection of the system to land should be standard.
2. The steel rope slides;
3. The input frequency of pulse is too high. And the highest input frequency of impulse of main board is 25KHZ. If the input frequency of pulse is above 25KHZ, please use the frequency dividing function of frequency divider to decrease pulse frequency.

▲ **Note: The calculation method of pulse frequency and the relevant relation should be:**

$$\frac{\text{Rated rotating speed} \times \text{the pulse quantity of encoder}}{60 \times \text{Frequency dividing coefficient} \times 1000} < 25\text{KHZ}$$

## 7.14 The main board does not receive signal feedback of operation from inverter (ER17)

When the main board sends out operation instruction (direction, enable) and doesn't receive signal feedback of operation from the inverter (X19). At this time, the following check should be carried out:
1. Please check the direction, enable signal and the output circuit of operation signals of the inverter;
2. Check if the setting of relevant parameters of inverter of input and output is correct;
3. Check if the inverter is in operation state.

## 7.15 Mistake of floor counting (ER18)

If such phenomenon occurs, there are following possible reasons:
1. The hoistway self learning is not finished, the floor data in the main board is not in conformity with that of actual floors;
2. Hoistway self learning is not carried out, after the installation position of end station switch of the hoistway, switch 1 and switch 2 of the upper and lower end station is changed.
3. The error of pulse input of encoder is excessive, refer to ER14 for solution.

## 7.16 The low-speed speed switching exceeding the spacing between two floors (ER19)

The distance required for the lowest running speed of the elevator is larger than the interval of single floor, therefore the elevator cannot operate.

1. When using the simulative setting, such failures occur when the elevator runs from the second top floor to the top floor or it runs from the second lowest floor to the lowest floor. You may increase the parameter of deceleration time set value of time parameters of b1, b2 p1, p2, p3 and p4 for system acceleration or deceleration in the simulation curve. When the speed of elevator is larger than 1 m/s, the failure may be eliminated by decreasing the running speed of single floor.

2. When multi-segment reference is used, the running distance under the minimum running speed of segment is larger than interval of single floor; therefore speed of segment can not be selected for the single floor running.

▲**Note: The throw-over distance at the lowest running speed(m)** $\times 2 + 0.15$ **(m) < the minimum floor interval (m)**

## 7.17 Thermal Switch Protection, the brake resistor is overheated or the electric motor is overheated (ER25)

Please check the thermal switch loop (The input point is X21).

## 7.18 The state of contact of contactor of gate interlock is inconformity with the state of the coil (ER26)

According to the requirement of **GB7588-2003 Standard to the loop of gate interlock, BL 3000 main board** is designed with the monitoring function for loop of gate interlock relay and its feedback contact; under normal condition, the motion of coil and the contact (X14 and X23) should keep in conformity, or else there will be failure alarm.

The state of contact of contactor of gate interlock is not in conformity with the state of the coil, that is to say X14 and X23 (terminal No. X24, X25) are not in conformity. Observe the input indicator LED X14 and LED X23, when contractor of the gate interlock switch on or switch off, LED X14 and LED X23 should be on or off simultaneously.

1. If they are not on or off at the same time, please check the external connection.
2. If they are on or off at the same time, please observe if the input signal display on the monitoring menu conforms to the state of LED indicators, if the state display of X23 input signal is not in conformity with the state of LED X23 indicator, the problem may be that the voltage of X23 input circuit is not compatible.

## 7.19 The inconformity between state of contact of emergency stop contactor and the coil

The state of contact of emergency stop contactor is in conformity with the state of the coil, namely, X13 and X22 (terminal no. X22, X 23) are not in conformity.

1. Observe indicator LED X13 and LED X22 for input display, when emergency stop contactor switch on or switch off, LED X13 and LED X22 should on and off at the same time.

2. If they are not on or off at the same time, please check the external connection;

3. If they are on and off at the same time. Please observe if the display of input signal on the monitoring menu conforms to the state of LED indicator, if the display of input signal X22 is not in conformity with the state of LED X22 Indicator, the problem may be that the voltage of input circuit X22 is not compatible.

# Appendix 1　Connection Diagram and Parameter Setting for Inverters Controlled by Asynchronous Motor

## 1．Connection graph and parameter setting table of YASKAWA 616G5, 676GL5-JJ Inverter

### （1） Inverter terminal connection diagram
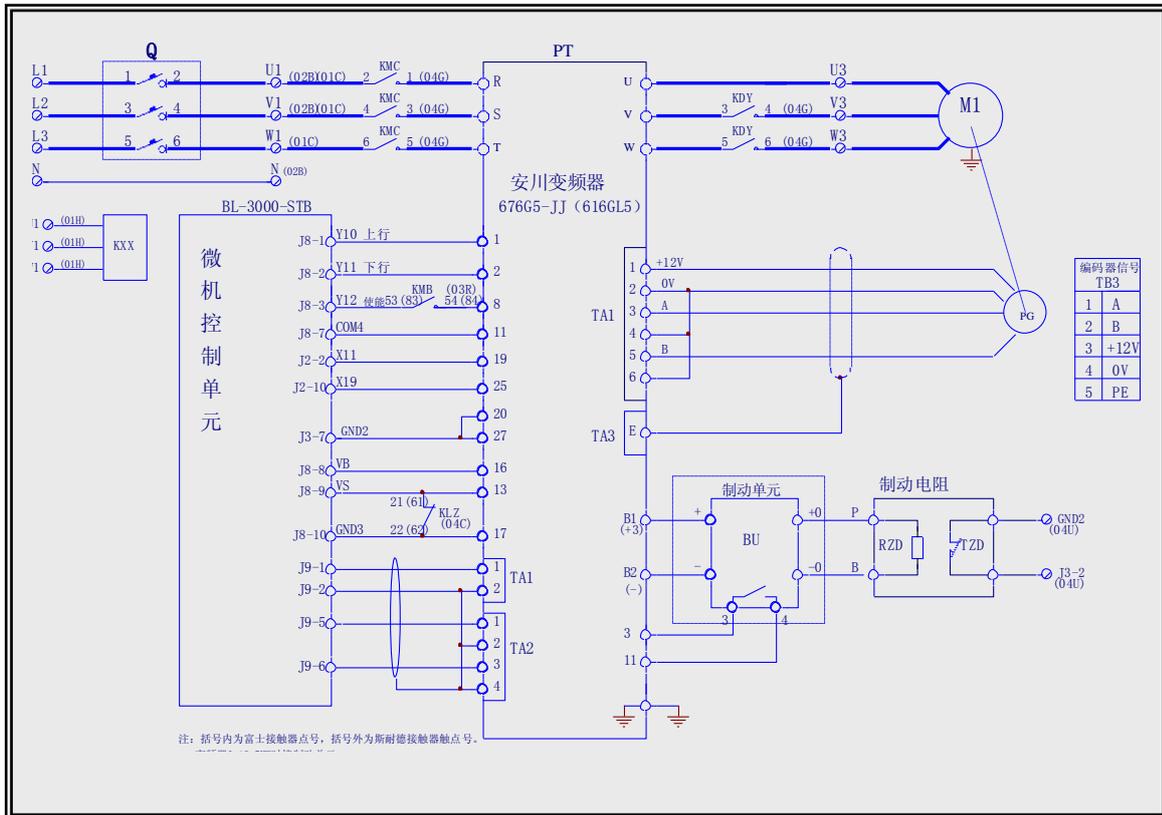


| | |
|---|---|
| 安川变频器 | YASKAWA inverter |
| 使能 | Enable |
| 微机控制单元 | Computer control unit |
| 制动电阻 | Brake resistor |
| 制动单元 | Brake unit |
| 注: 1)括号内为富士接触器触点号，括号外为施耐德接触器触点号 | Notes: 1) the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor. |

### （2） Instruction for keying

MENU and ESC keys: Displaying, exiting menu； "∧" and "∨s" key: Selecting menu, and modifying values

">" key: Selecting the modifying bit； DATA, ENTER key: Confirming

### （3） Parameter settings of inverter(for reference only)：simulation + multi-speed

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| A1-02 | Selection of Control mode | 3 | Vector control with PG |
| A1-00 | Language Selection | 0 | |

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| A1-01 | Parameter access level | 4 | |
| B1-01 | Selection of speed reference | 1 | Setting to 0 when multi speed |
| B1-02 | Selection of running reference | 1 | |
| B1-03 | Selection of stop method | 1 | |
| B1-04 | Selection of inversion inhibition | 0 | |
| B2-01 | Zero velocity level | 0.1 | |
| B2-03 | DC braking time when starting | 0 | |
| B2-04 | DC braking time when stopping | 1 | |
| C1-01 | Acceleration time 1 | 0.1 | Setting to 2.0 when multi speed (for reference) |
| C1-02 | Ramp-down time 1 | 0.1 | Setting to 2.0 when multi speed (for reference) |
| C1-03 | Acceleration time 2 | 2 | Setting to 2.0 when multi speed (for reference) |
| C1-04 | Ramp-down time 2 | 2 | Setting to 2.0 when multi speed (for reference) |
| C2-01 | S characteristic time when beginning acceleration | 0 | Setting to 1.5 when multi speed (for reference) |
| C2-02 | S characteristic time when stopping acceleration | 0 | Setting to 1.5 when multi speed (for reference) |
| C2-03 | S characteristic time when beginning deceleration | 0 | Setting to 1.5 when multi speed (for reference) |
| C2-04 | S characteristic time when stopping deceleration | 0 | Setting to 1.5 when multi speed (for reference) |
| C5-01 | ASR proportion gain 1 | 10 | |
| C5-02 | ASR integral time 1 | 0.35 | |
| D1-02 | Frequency reference 2 | 0 | Self leaning speed when multi speed(setting as the actual requirement) |
| D1-03 | Frequency reference 3 | 0 | Inspection traveling speed when multi speed (setting as the actual requirement) |
| D1-04 | Frequency reference 4 | 0 | Creep speed when multi speed (setting as the actual requirement) |
| D1-05 | Frequency reference 5 | 0 | Low speed when multi speed (V1) (setting as the actual requirement) |
| D1-06 | Frequency reference 6 | 0 | Medium speed when multi speed 1 (V2) (setting as the actual requirement) |
| D1-07 | Frequency reference 7 | 0 | Medium speed when multi speed 2 (V3) (setting as the actual requirement) |
| D1-08 | Frequency reference 8 | 0 | High speed when multi speed (V4) (setting as the |

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| | | | actual requirement) |
| D1-09 | Inching reference 2 | 200 | |
| E1-01 | Inverter input voltage | 380 | |
| E1-02 | Selection of motor | 0 | |
| E1-04 | Maximum output frequency | 50 | |
| E1-05 | Maximum voltage | 380 | |
| E1-06 | Basic frequency | 50 | |
| E1-09 | Minimum output frequency | 0 | |
| E2-01 | Motor rated current | * | See nameplate |
| E2-02 | Motor rated slip | * | See nameplate |
| E2-03 | Motor no-load current | * | 35-40% of rated current |
| E2-04 | Motor pole numbers | * | See nameplate |
| F1-01 | PG constant | * | According to setting of encoder |
| F1-02 | PG action selection when disconnection detection | 1 | |
| F1-03 | Action selection when overspeed | 0 | |
| F1-04 | Action selection when too large velocity deviation | 0 | |
| F1-06 | Frequency division ratio | 1 | |
| F1-08 | Detection standard when overspeed | 105 | |
| F1-09 | Detection delay time when overspeed | 1 | |
| F1-10 | Detection standard when too large velocity deviation | 30 | |
| **Parameters** | **Names** | **Setting values** | **Comments** |
| F1-11 | Detection delay time when too large velocity deviation | 1 | |
| H1-03 | Function selection of terminal 5 | F | (Setting 3 when multi speed) |
| H1-04 | Function selection of terminal 6 | F | (Setting 4 when multi speed) |
| H1-05 | Function selection of terminal 7 | 6 | Inching (Setting 5 when multi speed) |
| H1-06 | Function selection of terminal 8 | 9 | |
| H2-01 | Function selection of terminal 9 | F | |
| H2-02 | Function selection of terminal 25 | 37 | |
| H3-01 | Electrical level selection of terminal 13 | 0 | |
| H3-02 | Input gain of terminal 13 | * | Setting as the given analog voltage maximum and elevator speed |
| H3-03 | Input deviation of terminal 13 | 0 | |

| H3-04 | Electrical level selection of terminal 16 | 1 | |
| --- | --- | --- | --- |
| H3-05 | Function selection of terminal 16 | 14 | |
| H3-06 | Input gain of terminal 16 | 0 | |
| H3-07 | Input deviation of terminal 16 | 0 | |
| L3-04 | Stall function selection when deceleration | 0 | |
| L5-01 | Restart times when abnormal reset | 5 | |
| L8-05 | Action selection of input side open-phase protection | 1 | |
| L8-07 | Action selection of output side open-phase protection | 1 | |
| O1-01 | Monitor selection | 5 | |
| O1-02 | Monitor selection when power supply input | 1 | |
| O1-03 | Speed display unit | * | Pole numbers |
| O1-04 | Unit setting of frequency reference | 0 | |

## 2．Connection diagram and parameter setting table of YASKAWA G7A Inverter

### （1） Inverter terminal connection diagram
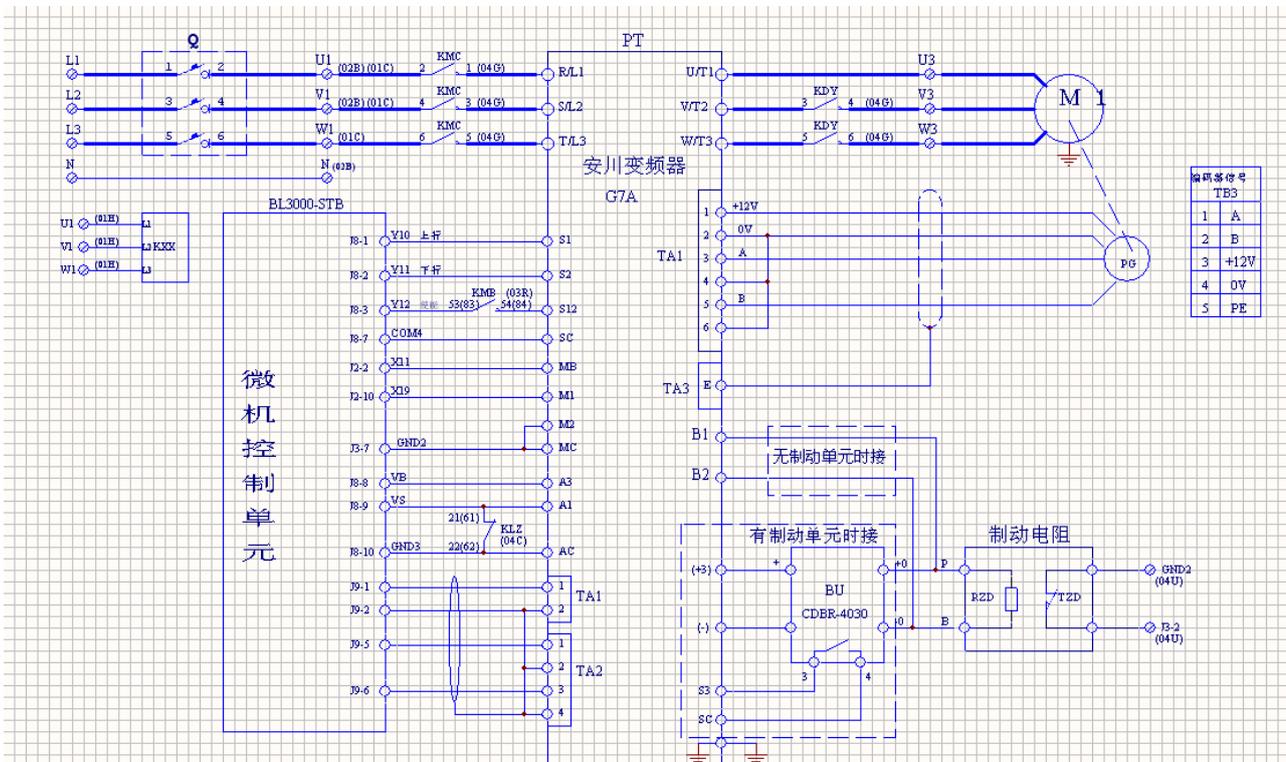


| 安川变频器 | YASKAWA inverter |
| --- | --- |
| 微机控制单元 | Computer control unit |
| 制动电阻 | Brake resistor |
| 无制动单元时接 | Connect when having no brake unit |
| 有制动单元时接 | Connect when having brake unit |

（2） **First setting "control mode" parameter A1-02=3.**

（3） **Then using "initialization" parameter A1-03=2220 to initialize the inverter parameter.**

（4） **Setting inverter parameters as the table below (for reference only)：simulation+multi-speed**

| parameters | Names | Setting values | Comments |
|---|---|---|---|
| A1-02 | Selection of Control mode | 3 | |
| A1-00 | Language Selection | 0 | |
| B1-01 | Selection of speed reference | 1 | Setting 0 when multi speed |
| B1-02 | Selection of running reference | 1 | |
| B1-03 | Selection of Stop method | 1 | Debug setup: 0 |
| B1-06 | Time selection for control terminal scanning twice | 0 | |
| B2-01 | Zero speed level | 0.1 | Debug setup: 0.5 |
| C1-01 | Acceleration time 1 | 1.0 | Setting 2.0 when multi speed (for reference) |
| C1-02 | Ramp-down time 1 | 1.0 | Setting 2.0 when multi speed (for reference) |
| C1-03 | Acceleration time 2 | 2.0 | Setting 2.0 when multi speed (for reference) |
| C1-04 | Ramp-down time 2 | 2.0 | Setting 2.0 when multi speed (for reference) |
| C2-01 | S characteristic time when beginning acceleration | 0 | Setting 1.5 when multi speed (for reference) |
| C2-02 | S characteristic time when stopping acceleration | 0 | Setting 1.5 when multi speed (for reference) |
| C2-03 | S characteristic time when beginning deceleration | 0 | Setting 1.5 when multi speed (for reference) |
| C2-04 | S characteristic time when stopping deceleration | 0 | Setting 1.5 when multi speed (for reference) |
| C5-01 | ASR proportion gain 1 | 10 | |
| C5-02 | ASR integral time 1 | 0.35 | |
| D1-02 | Frequency reference 2 | 0 | Self leaning speed when multi speed (setting as the actual requirement) |
| D1-03 | Frequency reference 3 | 0 | Inspection traveling speed when multi speed (setting as the actual requirement) |
| D1-04 | Frequency reference 4 | 0 | Creep speed when multi speed (setting as the actual requirement) |
| D1-05 | Frequency reference 5 | 0 | Low speed when multi speed (V1) (setting as the actual requirement) |
| D1-06 | Frequency reference 6 | 0 | Medium speed when multi speed 1 (V2) (setting as the actual requirement) |
| D1-07 | Frequency reference 7 | 0 | Medium speed when multi speed 2 (V3) (setting as the actual requirement) |
| D1-08 | Frequency reference 8 | 0 | High speed when multi speed (V4) (setting as the actual requirement) |
| D1-17 | Inching frequency reference | 200 | Frequency references when multifunction input "selecting inching frequency" and "FJOG |

| | | | reference" are on. |
|---|---|---|---|
| E1-01 | Inverter input voltage | 380 | |
| E1-04 | Maximum output frequency | 50 | This parameter is same as E1-06 |
| E1-05 | Maximum voltage | 380 | Setting as rated voltage. |
| E1-06 | Basic frequency | 50 | Setting as rated frequency. |
| E1-09 | Minimum output frequency | 0 | |
| E2-01 | Motor rated current | * | Setting as rated current. |
| E2-02 | Motor rated slip | * | Using equations to calculate slip as rated revolutions. |
| E2-03 | Motor no-load current | * | 35%～40% of rated current |
| E2-04 | Motor pole numbers | * | See motor nameplate |
| E2-11 | Motor rated capacity | * | |
| F1-01 | PG pulse numbers | * | Setting as actual installing encoder |
| F1-03 | Action selection when overspeed | 0 | |
| F1-04 | Action selection when too large velocity deviation | 0 | |
| F1-10 | Detection standard too large velocity deviation | 30 | |
| F1-11 | Detection delay time when too large velocity deviation | 1.0 | |
| H1-01 | Function of selecting terminal S3 | 24 | Multifunction contact inputting 1 |
| H1-02 | Function of selecting terminal S4 | F | Multifunction contact inputting 2 |
| H1-03 | Function of selecting terminal S5 | F | Multifunction contact inputting 3 (Setting 3 when multi speed) |
| H1-04 | Function of selecting terminal S6 | F | Multifunction contact inputting 4 (Setting 4 when multi speed) |
| H1-05 | Function of selecting terminal S7 | F | Multifunction contact inputting 5 (Setting 5 when multi speed) |
| H1-06 | Function of selecting terminal S8 | F | Multifunction contact inputting 6 |
| H1-07 | Function of selecting terminal S9 | F | Multifunction contact inputting 7 |
| H1-08 | Function of selecting terminal S10 | F | Multifunction contact inputting 8 |
| H1-09 | Function of selecting terminal S11 | F | Multifunction contact inputting 9 |
| H1-10 | Function of selecting terminal S12 | 9 | Multifunction contact inputting 10 |
| H2-01 | Function of selecting terminal S M1-M2 | 37 | |
| H3-01 | Selecting frequency reference (voltage) terminal A1 signal electrical level | 0 | |
| H3-02 | Selecting frequency reference (voltage) terminal A1 input gain | 100% | Setting as the given analog voltage maximum and elevator speed |
| H3-03 | Selecting frequency reference (voltage) terminal A1 signal offset | 0 | |
| H3-04 | Selecting multifunction analog input terminal A3 signal electric level | 1 | |
| H3-05 | Selecting multifunction analog input terminal A3 function | 14 | |
| H3-06 | Selecting multifunction analog input | 100% | |

| | terminal A3 input gain | | |
|---|---|---|---|
| L5-01 | Restart times when abnormal reset | 5 | |
| L8-05 | Action selection of input side open-phase protection | 1 | |
| L8-07 | Action selection of output side open-phase protection | 1 | |
| O1-01 | Monitor selection | 5 | |
| O1-02 | Monitor selection when power supply input | 1 | |
| O1-03 | Selection of frequency reference | * | Setting as motor pole numbers |
| O1-04 | Unit setting of frequency reference | 0 | |
| O2-01 | Function selection of local and remote keys | 0 | |
| O2-02 | Function selection of STOP key | 0 | |
| L3-04 | Stall preventing function selection when deceleration | 0 | |

# 3．Connection diagram and parameter setting 3.0 version of KEB F4 Inverter

（1） **Inverter terminals connection diagram**
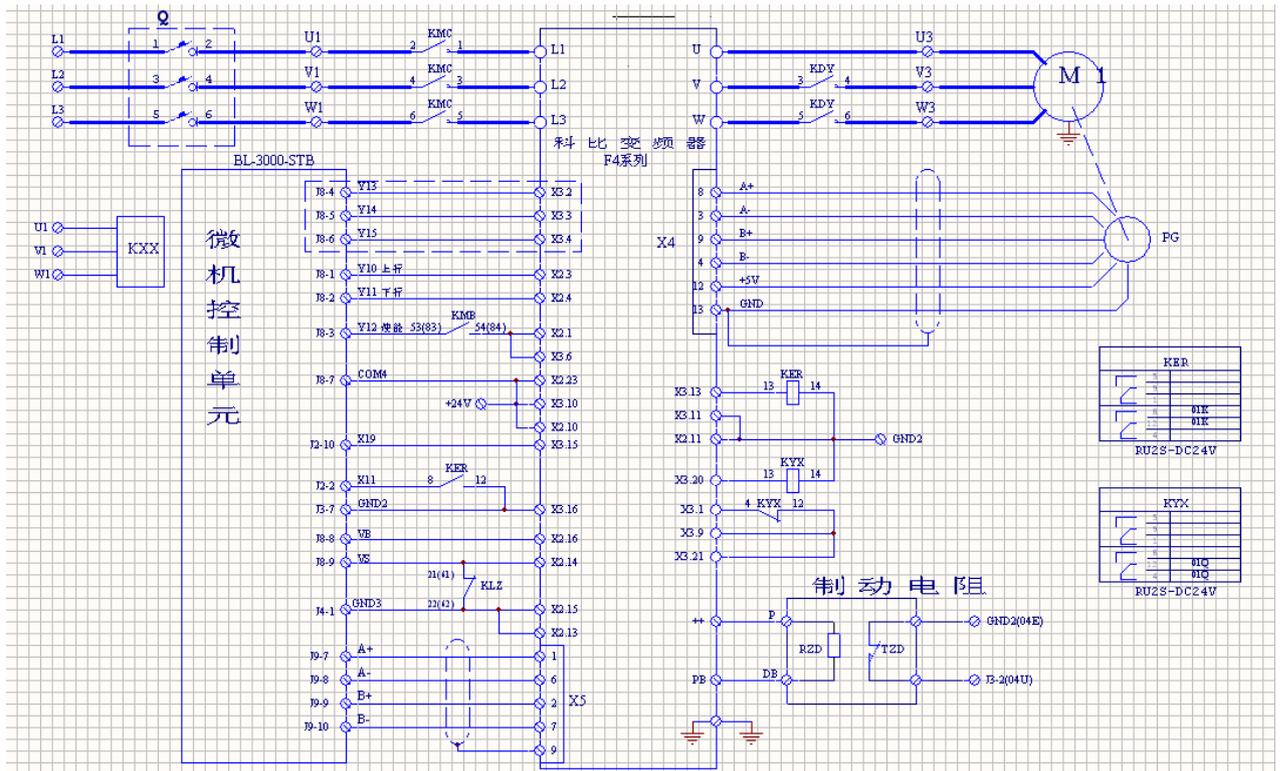


（2） **Setting inverter parameters as table below (for reference only): simulation**

| Parameters | Names | Setting values | Notes |
|---|---|---|---|
| LF.00 | Password | -4 | |
| LF.01 | User password | 440 | |
| LF.02 | Operation mode | 3 | |
| LF.03 | Frequency dividing coefficient | 1 | |
| LF.04 | Motor selection | 0 | |

| Parameters | Names | Setting values | Notes |
|---|---|---|---|
| LF.05 | Running direction adjustment | 0 | |
| LF.10 | Rated power of asynchronous motor | | Setting as spot actual parameter |
| LF.11 | Rated speed of asynchronous motor | | Setting as spot actual parameter |
| LF.12 | Rated current of asynchronous motor | | Setting as spot actual parameter |
| LF.13 | Rated frequency of asynchronous motor | | Setting as spot actual parameter |
| LF.14 | Rated voltage of asynchronous motor | | Setting as spot actual parameter |
| LF.15 | Power factor of asynchronous motor | | Setting as spot actual parameter |
| LF.16 | Speed of weak magnetic field | | Setting as spot actual parameter |
| LF.17 | Encoder resolution of asynchronous motor | | Setting as spot actual parameter |
| LF.18 | Encoder phase sequence of asynchronous motor | 0 | |
| LF.19 | DC voltage compensation | 400 | |
| LF.20 | Rated system speed | | Setting as spot actual parameter |
| **Parameters** | **Names** | **Setting values** | **Notes** |
| LF.21 | Diameter of hoist wheel | | Setting as spot actual parameter |
| LF.22 | Reduction ratio of hoist machine | | Setting as spot actual parameter |
| LF.23 | Roping mode of hoist rope | | Setting as spot actual parameter |
| LF.24 | Deadweight | | |
| LF.30 | Control mode | 2 or 3 | 2:closed loop 3: closed loop + pre-torque |
| LF.31 | Velocity proportion of asynchronous motor | 3000 | |
| LF.32 | Velocity integral of asynchronous motor | 1000 | |
| LF.33 | Velocity integral offset of asynchronous motor | 1000 | |
| LF.34 | Current proportion of asynchronous motor | 1500 | |
| LF.35 | Current integral of asynchronous motor | 500 | |
| LF.36 | Maximum torque of asynchronous motor | $2 \times LF91$ | |
| LF.38 | Modulation frequency transform | 0 | |
| LF.50 | Rapid acceleration | 9.99 | |
| LF.51 | Acceleration | 2.0 | |
| LF.52 | Rapid deceleration | 9.99 | |
| LF.53 | Deceleration | 2.0 | |
| LF.54 | Parking slope | 9.99 | |
| LF.60 | Braking speed | 0.005 | |

| | | | |
|---|---|---|---|
| LF.61 | Overspeed monitor | 1.1×LF20 | |
| LF.62 | Deceleration monitor | 0.95LF20 | |
| LF.63 | Creeping monitor | 0.25 | |
| LF.64 | DC voltage monitor | | |
| LF.65 | Overheat delay monitor | 300 | |
| LF.66 | Radiator temperature monitor | 40 | |
| LF.67 | Pretorque gain | 1 | |
| LF.68 | Pretorque deviation | 0 | |
| LF.69 | Pretorque direction | 0 | |
| LF.70 | Braking open time | 0.3 | |

## 4．Connection diagram and parameter setting table of FUJI G11UD Inverter

（1） **Inverter terminal connection diagram**
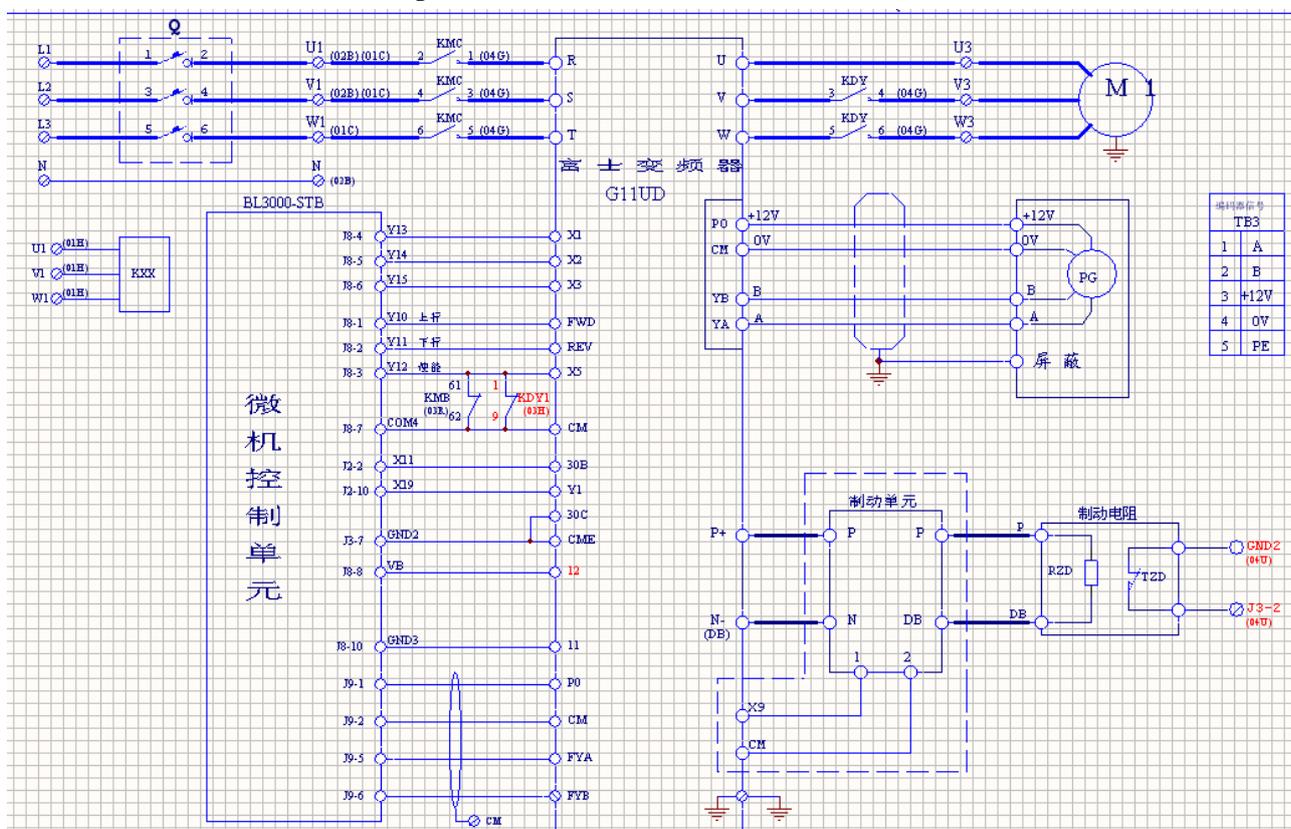


（2） **Setting inverter parameters as table below (for reference only): multi-stage**

| Parameters | Names | Setting values | Notes |
|---|---|---|---|
| F01 | Frequency setting 1 | 0 | |
| F02 | Selection of running reference | 1 | |
| F03 | Maximum output frequency 1 | 50Hz | |
| F04 | Basic frequency 1 | 50Hz | |
| F05 | Rated voltage 1 | 380V | |
| F06 | Maximum voltage 1 | 380V | |
| F07 | Acceleration time 1 | 0.01S | |

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| F08 | Ramp-down time 1 | 0.01S | |
| F15 | Frequency upper limit | 50Hz | Setting according to the given analog voltage maximum and elevator speed |
| F16 | Frequency lower limit | 0 Hz | |
| F17 | Setting proportional frequency of analog input | * | Setting proportional frequency of analog input |
| F18 | Analog setting frequency offset | 0 | |
| F23 | Start-up frequency | 0.4Hz | |
| F24 | Run time of start-up frequency | 0.3s | |
| F25 | Stopping frequency | 0.1Hz | |
| F26 | Switching frequency | 15KHz | |
| F27 | Motor timbre | 0 | |
| F36 | 30Ry action mode | 0 | |
| F40 | Torque limitation 1 (electric) | 200 | |
| F41 | Torque limitation1 (braking) | 200 | |
| E01 | Function selection of terminal X1 | 0 | |
| E02 | Function selection of terminal X2 | 1 | |
| E03 | Function selection of terminal X3 | 2 | |
| E04 | Function selection of terminal X4 | 4 | |
| E05 | Function selection of terminal X5 | 7 | |
| E09 | Function selection of terminal X9 | 9 | Setting 4 when 7.5KW |
| E10 | Acceleration time 2 | 0.01s | |
| E11 | Ramp-down time2 | 0.01s | |
| E12 | Acceleration time 3 | 0.01s | |
| E13 | Ramp-down time 3 | 0.01s | |
| E14 | Acceleration Time   4 | 0.01s | |
| E20 | Selection of Y1 terminal function | 7 | |
| E21 | Selection of Y2 terminal function | 34 | |
| E22 | Selection of Y3 terminal function | 37 | |
| E23 | Selection of Y4 terminal function | 1 | |
| E25 | Y5 action method | 0 | |
| E33 | Overload (OL) action selection | 1 | |
| E34 | Overload (OL) action value | P06×0.05 | |
| E35 | Overload (OL) action time | 0.2 S | |
| E46 | Setting language | 1 | |
| C05 | Multi speed 1 | * | terminal landing creep speed (setting as the actual requirement) |
| CO6 | Multi speed 2 | * | Inspection traveling speed (setting as the actual requirement) |
| CO7 | Multi speed 3 | * | Creep speed (setting as the actual requirement) |

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| C10 | Multi speed 6 | * | Medium speed (setting as the actual requirement) |
| C11 | Multi speed 7 | * | High speed (setting as the actual requirement) |
| C31 | Analog input deviation adjustment | 0 | |
| P01 | Motor pole numbers | * | Setting as motor nameplate |
| P02 | Motor power | * | Setting as motor nameplate |
| P03 | Motor rated current | * | Setting as motor nameplate |
| P06 | Motor no-load current | * | Setting as default value |
| P09 | Motor rated slip | note | |
| H11 | Deceleration mode | 1 | |
| H18 | Torque control | 3 | Torque offset of terminal 12 |
| O01 | Selection of speed reference mode | 1 | Required to set 1 |
| **Parameters** | **Names** | **Setting values** | **Comments** |
| O02 | Velocity instrument filter time constant | 0.020 | |
| O03 | Encoder pulse numbers | * | Setting as practical configuration |
| O04 | ASR P constant (high speed) | 20 | |
| O05 | ASR I constant | 0.1 | |
| O06 | Velocity feedback filter time constant | 0.003 | |
| O07 | ASR P constant switching frequency 1 | 5 | |
| O08 | ASR P constant switching frequency 2 | 10 | |
| O09 | ASR P constant (low speed) | 20 | |
| O10 | Multi-speed velocity instrument consistent timing | 0.005S | S-type curve when finishing medium acceleration |
| O13 | S-type curve setting 1 | * | S-type curve when beginning acceleration (setting according to requirements) |
| O16 | S-type curve setting 4 | * | S-type curve when finishing medium speed acceleration (setting according to requirements) |
| O17 | S-type curve setting 5 | * | S-type curve when beginning medium speed deceleration (setting according to requirements) |
| O18 | S-type curve setting 6 | * | S-type curve when finishing high speed acceleration (setting according to requirements) |
| O19 | S-type curve setting 7 | * | S-type curve when beginning high speed deceleration (setting according to requirements) |
| O20 | S-type curve setting 8 | * | S-type curve when finishing deceleration (setting according to requirements) |
| O21 | S-type curve setting 9 | * | (Setting according to requirements) |
| O22 | S-type curve setting 10 | * | (Setting according to requirements) |
| O37 | Torque instrument filter time constant | 0.0 | |

| O38 | Start-up time | 0.3 | |
|------|---------------|-----|---|
| C31 | Analog input deviation adjustment (terminal 12) | 0 | |
| C32 | Deviation adjustment | 0 | |
| C33 | Analog input filter | 0.05 | |
| H18 | Torque control | 3 | Torque offset of terminal /2 |

△ **Note: Motor rated slip frequency= basic frequency** $\times \dfrac{\text{Synchronous speed – rated speed}}{\text{Synchronous speed [r/min]}}$ **[Hz]**

## 5. Connection diagram and parameter setting table of FUJI FRENIC-LIFT inverter

### (1) Terminal connection diagram of the inverter
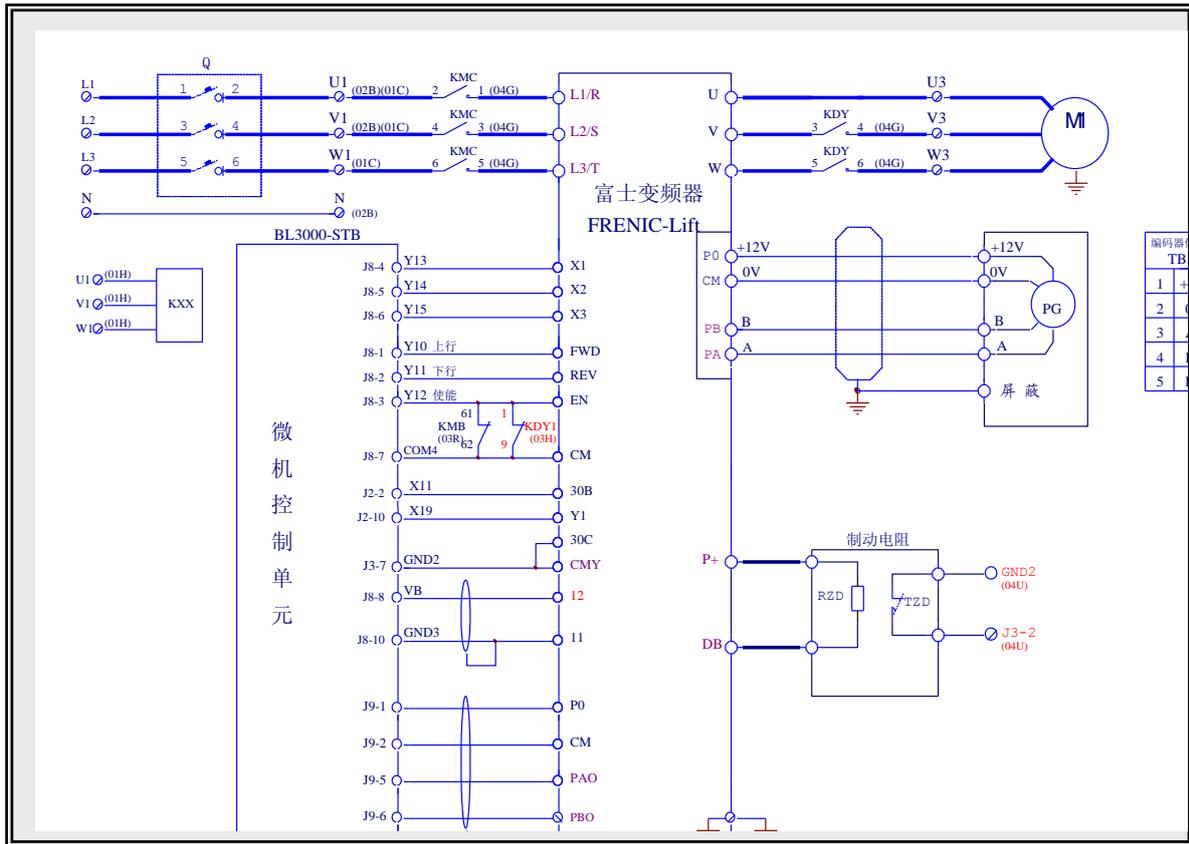
**(2) Setting inverter parameters as the table below (for reference only): multi-speed**

| Parameters | Names | Setting value | Comments |
|---|---|---|---|
| F01 | Speed setting | 0 | Multistep speed instrument with S curve acceleration and deceleration(SS1, SS2, SS4) |
| F03 | Maximum speed | * | Setting as motor nameplate |
| F04 | Rated speed | * | Setting as motor nameplate |
| F05 | Rated voltage | 380V | |
| F07 | Acceleration and Ramp-down time 1 | 3.5S | Low speed acceleration time |
| F08 | Acceleration and Ramp-down time 2 | 2.1S | Low speed Ramp-down time |
| F23 | Starting speed | 0.4Hz | |
| F24 | Duration time | 0.3s | |
| F25 | Stopping speed | 0.1Hz | |
| F42 | Control selection | 0 | Control with PG vector  (asynchronous motor) |
| E01 | Function selection of terminal X1 | 0 | |
| E02 | Function selection of terminal X2 | 1 | |
| E03 | Function selection of terminal X3 | 2 | |
| E10 | Acceleration and Ramp-down time 3 | 3.5s | Low speed acceleration time |
| E11 | Acceleration and Ramp-down | 2.5s | Medium speed Ramp-down time |

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| | time 4 | | |
| E12 | Acceleration and Ramp-down time 5 | 3.5s | High speed acceleration time |
| Parameters | Names | Setting values | Comments |
| E13 | Acceleration and Ramp-down time 6 | 2.0s | High speed Ramp-down time |
| E14 | Acceleration and Ramp-down time 7 | 11s | Creep Ramp-down time |
| E18 | Multi-level speed instrument consistent timer | 2 | |
| E19 | Multi-level speed instrument consistent timer time | 0.010 | |
| E20 | Function selection of terminal Y1 | 35 | Inverter output |
| E27 | Terminal 30A/B/C (relay output) | 99 | Integral alarm |
| E48 | LED monitor detailed content | 2 | Speed setting |
| E61 | Terminal 12 (function selection) | 4 | Torque offset instrument |
| C05 | Multi-speed speed1 | 8 | terminal landing creep speed (unit: HZ) |
| C06 | Multi-speed speed 2 | 8 | Inspection traveling speed |
| C07 | Multi-speed speed 3 | 3 | Creep speed |
| C10 | Multi-speed speed 6 | 30 | Medium speed |
| C11 | Multi-speed speed 7 | 45 | High speed |
| C31 | Analog input deviation adjustment (terminal 12) | 0 | |
| C32 | Analog input gain adjustment (terminal 12) | 100％ | |
| C33 | Analog input filter adjustment (terminal 12) | 0.05s | |
| P01 | Motor pole numbers | * | Setting as motor nameplate |
| P02 | Motor capacity | * | Setting as motor nameplate |
| P03 | Motor rated current | * | Setting as motor nameplate |
| P06 | Motor no-load current | * | Setting as default value |
| P12 | Motor rated slip | noting | |
| L01 | Pulse programmer (selection) | 2 | A, B phase: 12, 15V complement, oc, 5Vcable-driven. |
| L02 | Pulse numbers | * | Setting as practical configuration |
| L19 | S-shaped setting 1 | 20 | S-type curve when beginning acceleration |
| L22 | S-shaped setting 4 | 20 | S-type curve when finishing medium speed acceleration |
| L23 | S-shaped setting 5 | 20 | S-type curve when beginning medium speed deceleration |
| L24 | S-shaped setting 6 | 20 | S-type curve when finishing high speed acceleration |
| L25 | S-shaped setting 7 | 16 | S-type curve when beginning high speed deceleration |
| L26 | S-shaped setting 8 | 18 | S-type curve when finishing deceleration |
| L27 | S-shaped setting 9 | 30 | |

| L28 | S-shaped 10 | 30 | |
|-----|-------------|-----|---|
| L36 | P constant when high speed | 8 | |
| L37 | I constant when high speed | 0.5s | |
| L38 | P constant when low speed | 10 | |
| L39 | I constant when low speed | 0.5s | |
| L40 | Switching speed 1 | 5HZ | |
| L41 | Switching speed 2 | 10HZ | |
| L60 | Torque offset driving side gain | 50％ | Setting as spot actual value |
| L61 | Torque offset braking side gain | 50％ | Setting as spot actual value |

Notes: Motor rated slip frequency = basic frequency $\times \dfrac{\text{Synchronous speed} - \text{Rated speed}}{\text{Synchronous speed [r/min]}}$ [Hz]

Self-tuning implementation:

1、 Set 1 or 2 in the function code P04, and press DATA key. (Flashing displayed by 1 or 2 can turn slow.)

2、 Input the running instrument of determined rotation direction.

3、 Lighten the display of 1 or 2, and begin self-tuning. (Self-tuning time: maximum value is about 15 seconds when P04=1, and maximum value is about 15 seconds when P04=1)

4、 Display end when determination is over.

5、 Set running instrument as OFF, then self-tuning is over. Operation panel will display next function code (P06).

Motor constants after self-tuned will be saved automatically, respectively once resistance ％R1 is P07, leaking reactance ％X is P08, no-load current is P06, and rated slip is P12.

# 6．Connection diagram and parameter setting table of SIEI Inverter

**(1) Terminal connection diagram of the inverter**
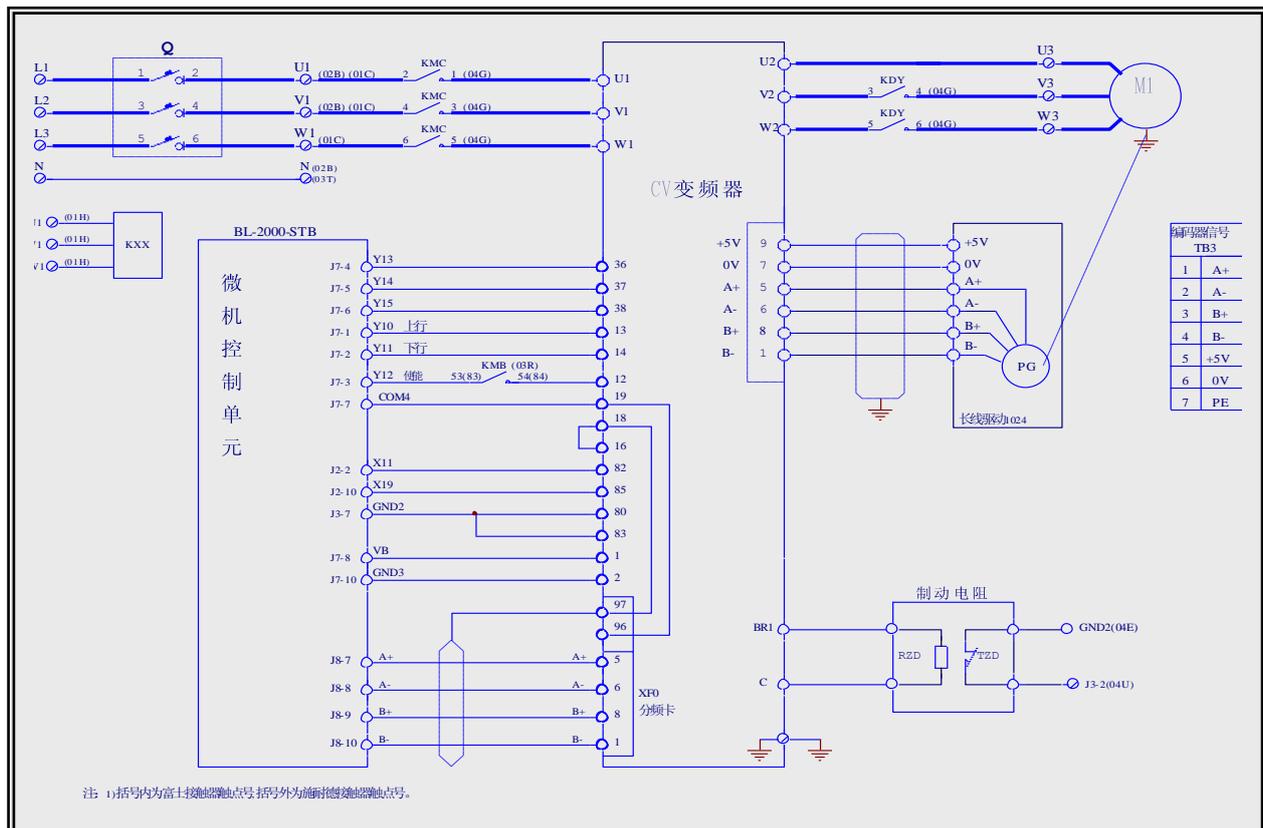
**(2) Setting inverter parameters as the table below (for reference only): multi-speed**

**Notes: Standard and type of inverters should be AVy…AC/AC4, wherein, ellipsis part should be inverter power**

**Encoders are set by jumpers S11—S17 which should be set as OFF**

Speed setup is as below

| Items | Terminals | | | Speed values |
|---|---|---|---|---|
| | 38 | 37 | 36 | |
| Self learning speed | 0 | 0 | 1 | 200mm/s |
| Inspection traveling speed | 0 | 1 | 0 | 200mm/s |
| Creep speed | 0 | 1 | 1 | 50 mm/s |
| Speed 4 | 1 | 0 | 0 | 0 mm/s |
| Speed 3 | 1 | 0 | 1 | 0mm/s |
| Speed 2 | 1 | 1 | 0 | 800mm/s |
| Rated speed $V_1$ | 1 | 1 | 1 | 1000mm/s |

Debugging steps:

1. Check wiring of inverter main circuit and control circuit again to avoid damaging inverter after finishing wiring; and check wiring connection. Check whether the output lines U V W and the motor lines U V W are corresponding.

2. After the careful examination, set parameters and then run the idle operation.

3. In the case of normal running of idle operation, put the elevator into the normal operation state, and run the normal operation to check whether the backward sliding or overshooting will happen when the elevator is in the up and down motion, if the back sliding exists then increase the pretorque function.

4. When both normal and idle operations are normal, adjust S curve parameters and P, I parameters to set the comfortable degree of high-speed elevator.

1. Motor data

| Parameters | Setting values | Comments |
|---|---|---|
| Rated voltage | 380V | |
| Rated frequency | 50HZ | * |
| Rated current | 23.5A | * |
| Rated speed | 1440pm | |
| Rated power | 11KW | * |
| Cosfi | 0.85 | * |
| Efficiency | 96％ | * |
| | | |

2. Self learning

See the subsequent motor current self-learning steps.

3. Hoist machine data

| Parameters | Setting values | Comments |
|---|---|---|
| Speed units selection | Millimeters | |
| deceleration ratio | 2 | |
| Hoist wheel diameter | 410mm | * |
| Maximum speed scale | 150rpm | * |

## 4. Car weight data

| Parameters | Setting values | Comments |
|---|---|---|
| Car weight | 2100kg | * |
| Counter weight | 2900kg | * |
| Maximum load weight | 1600kg | * |
| Rope weight | 300kg | * |
| Motor inertia | 5.0 | * |
| Gearbox inertia | 0.0 | * |

## 5. Encoders data

| Parameters | Setting values | Comments |
|---|---|---|
| Encoder type | 0 (Std encoder) | |
| Standard encoder type | Digital | |
| Standard encoder pulses | 1024pps | |
| Standard encoder mode | 0(FP) | |
| Standard encoder supply | 0 (5.14V) | |

## 6. Braking unit data

| Parameters | Setting values | Comments |
|---|---|---|
| Braking unit control | 1 (internal) | |
| Braking resistance | 15Ω | * |
| Braking unit resistance power | 8.0KW | * |

## 7. Control mode parameter

| C | Setting values | Comments |
|---|---|---|
| Control mode selection | Field oriented | |

## 8. Multi-speed parameter

| Parameters | Setting values | Comments |
|---|---|---|
| Smooth start speed | 0 | |
| Self-learning speed (Multi speed 1) | 200mm/s | |
| Inspection traveling speed (Multi speed 2) | 200mm/s | |
| Creep speed (Multi speed 3) | 50 mm/s | |
| Speed 4 (Multi speed 4) | 0mm/s | |
| Speed 3 (Multi speed 5) | 0mm/s | |
| Speed 2 (Multi speed 6) | 800mm/s | |
| Rated speed (Multi speed 7) | 1000mm/s | |

## 9. Ramp curve parameter

| Parameters | Setting values | Comments |
|---|---|---|
| Initial jerk acceleration (MR0 acc ini jerk) | 300 mm/s$^3$ | |
| Acceleration (MR0 acceleration) | 600 mm/s$^2$ | |
| End jerk acceleration (MR0 acc end jerk) | 500 mm/s$^3$ | |
| Initial jerk deceleration (MR0 dec ini jerk) | 500 mm/s$^3$ | |
| Deceleration (MR0 deceleration) | 600mm/s$^2$ | |

| Parameters | Setting values | Comments |
|---|---|---|
| End jerk deceleration (MR0 dec end decel) | $500mm/s^3$ | |
| Ending deceleration (MR0 end decel) | $200mm/s^2$ | |

## 10. Elevator time sequence parameter

| Parameters | Setting values | Comments |
|---|---|---|
| Contactor close delay | 304ms | |
| Brake open delay | 416ms | |
| Smooth start delay | 400ms | |
| Brake close delay | 3000ms | |
| Contactor open delay | 200ms | |

## 11. Speed P1 parameter

| Parameters | Setting values | Comments |
|---|---|---|
| SpeedP1      gain% | 20% | |
| Speedl1       gain% | 3.3% | |
| SpeedP2      gain% | 20% | |
| Speedl2       gain% | 5% | |
| Speedl3       gain% | 12% | |
| Speed 0      enable | 2(Enable as start) | |
| Speed 0 P gain% | 19% | |
| Speed 0 I gain% | 20% | |
| Filter time | | |

## 12. Speed threshold parameter

| Parameters | Setting values | Comments |
|---|---|---|
| Spd 0 ref thr | 1rpm | |
| Spd 0 ref delay | 3000ms | |
| Spd 0 speed thr | 1rpm | |
| Spd 0 spd delay | 3000ms | |
| SGP tran21 h thr | 94% | |
| SGP tran32 l thr | 5% | |
| SGP tran21 band | 4% | |
| SGP tran 32 band | 4% | |

## 13. Speed PI regulator parameter

| Parameters | Setting values | Comments |
|---|---|---|
| Speed P base value | 50A/rpm | |
| Speed I base value | 8000A/rpm | |

14：

| Parameters | Setting values | Comments |
|---|---|---|
| TRAVEL\Ramp function | Using default value | |
| TRAVEL\Ramp setpoint | Using default value | |
| TRAVEL\ Speed setpoint | Using default value | |

Notes: the parameters designated with * symbol are set according to actual conditions.

## 7. Connection diagram and parameter setting table of YASKAWA L7B Inverter

(1) Terminal connection diagram of the inverter
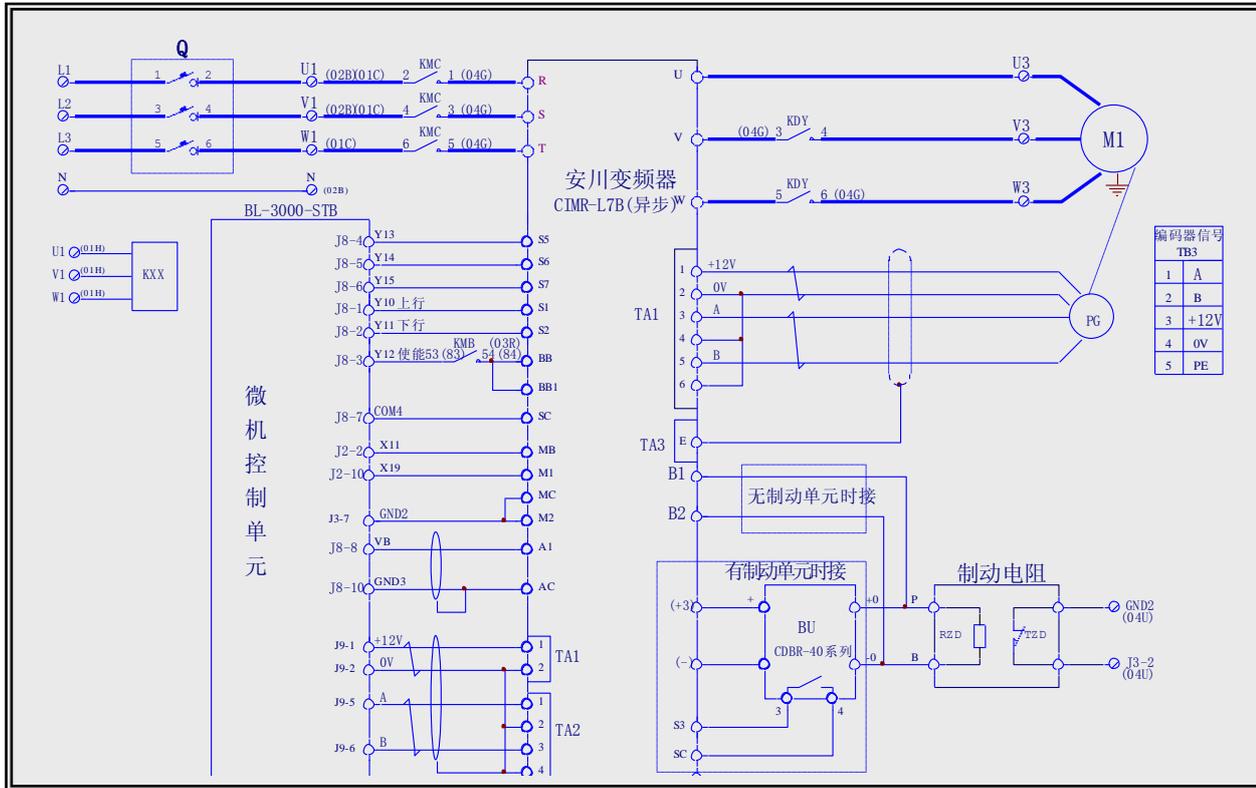


Setting steps of inverter parameters:

1．First use Initialization parameter A1-03=2220, then initialize the inverter parameters.
2．Set Control Mode parameter A1-02=3.
3．Setting inverter parameters as table below ( multi speed for reference only): set o1-03=motor pole numbers，o1-04=1 displays revolutions.

| Parameters | Names | Setting values | Comments |
|---|---|---|---|
| A1-00 | Display language selection of digital manipulator | 0 | English (default) |
| A1-01 | Parameter access level | 2 | ADVANDCED |
| A1-02 | Selection of control mode | 3 | Vector with PG |
| B1-01 | Selection of frequency reference | 0 | Digital manipulator |
| B1-02 | Selection of running reference | 1 | control circuit terminal (sequence control) |
| B1-03 | Selection of stop method | 1 | Free running stop |
| B1-06 | Twice reading time selection of control terminal | 0 | 2ms |
| C1-01 | Ramp-up time 1 | 2 | Setting with the unit of second Acceleration time from 0％ to 100 % of maximum output frequency |

| | | | Setting as the unit of second |
|---|---|---|---|
| C1-02 | Ramp-down time 1 | 2 | Ramp-down time from 100％ to 0 % of maximum output frequency |
| C1-08 | Ramp-down time 4 | 3～5 | Lower than Ramp-down time under C1-11 frequency |
| C1-11 | Switching frequency of acceleration and Ramp-down time | * | Be consistent with setup of d1-04 |
| C2-01 | S characteristic time when beginning acceleration | 0.7 | |
| C2-02 | S characteristic time when finishing acceleration | 0.7 | |
| C2-03 | S characteristic time when beginning deceleration | 0.7 | |
| C2-04 | S characteristic time when finishing deceleration | 0.7 | |
| C5-01 | AASR proportion gain 1 | 10 | |
| C5-02 | ASR integral time 1 | 0.35 | |
| d1-02 | Frequency reference 2 | 0 | Self learning speed (setting as practical requirement) |
| d1-03 | Frequency reference 3 | 200 | Inspection traveling speed (setting as practical requirement) |
| d1-04 | Frequency reference 4 | 30 | Creep speed (setting as practical requirement) |
| d1-05 | Frequency reference 5 | * | Low speed (V1) (setting as practical requirement) |
| d1-06 | Frequency reference 6 | * | Medium speed 1 (V2) (setting as practical requirement) |
| d1-07 | Frequency reference 7 | * | Medium speed 2 (V3) (setting as practical requirement) |
| d1-08 | Frequency reference 8 | * | High speed (V4) (setting as practical requirement) |
| E1-01 | Inverter input voltage | 380 | Unit: V |
| E1-04 | Maximum output frequency/revolutions | * | This parameter is the same as E1-06 |
| E1-05 | Maximum voltage | * | Setting as motor nameplate |
| E1-06 | Basic frequency/revolutions | * | Setting as motor nameplate |
| E1-09 | Minimum output frequency/revolutions | 0 | |
| E2-01 | Motor rated current | * | Setting as motor nameplate, paying attention to units |

| Parameters | Names | Setting values | Comments |
|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| E2-02 | Motor rated slip | * | Using equation to calculate slip according to rated speed |
| E2-03 | Motor idle current | * | 35%-40% of rated current |
| E2-04 | Motor pole number | * | Setting as motor nameplate |
| E2-11 | Motor Rated capacity | * | Motor power |
| F1-01 | P PG Pulse | * | Setting as actual encoder |
| F1-03 | Action selection when overspeed | 0 | |
| F1-04 | Action selection when detection of oversize velocity deviation | 0 | |
| F1-08 | Overspeed detection standard | 105 | |
| F1-09 | Overspeed detection delay time | 1 | |
| F1-10 | Detection standard when oversize velocity deviation | 30 | |
| F1-11 | Detection relay time when oversize velocity deviation | 1.0 | |
| H1-01 | Function selection of terminal S3 | 24 | Multifunction contact input 1 |
| H1-02 | Function selection of terminal S4 | 14 | Multifunction contact input 2 |
| H1-03 | Function selection of terminal S5 | 3 | Multifunction contact input  3 |
| H1-04 | Function selection of terminal S6 | 4 | Multifunction contact input 4 |
| H1-05 | Function selection of terminal S7 | 5 | Multifunction contact input 5 |
| H2-01 | Function selection of terminal M1-M2 | 37 | |
| H3-15 | Function selection of terminal A1 | 1 | Torque compensation |
| H3-16 | Input gain of terminal A1 | 120% | Setting according to the spot |
| H3-17 | Input offset of terminal A1 | 0 | |
| L3-04 | Stall prevention function selection when deceleration | 0 | |
| L8-07 | Selection of output side open-phase protection | 1 | |
| o1-01 | Displaying item selection in driving mode | 5 | Selecting the monitoring item number required to display under the driving mode |
| o1-02 | Monitor displaying item selection when supply is ON | 1 | Setting monitoring frequency reference |
| o1-03 | Unit selection of frequency reference setting/ display | * | Setting as motor pole number |
| o1-04 | Setting unit of frequency reference relative parameters | 1 | Displaying revolutions |
| S1-20 | Zero servo gain | * | Setting according to on-site setting |
| S1-24 | Torque compensation offset in upward motion | -60% | Setting according to on-site setting |
| S1-25 | Torque compensation offset in downward motion | -60% | Setting according to on-site setting |

# * Adjustment methods of starting torque compensation are as below:

1.  **Parameter H3-15=1, terminal A1 of analog input is 0～10V.**

2. **Parameter H3-17=0.**

3. **Adjust parameters S1-24, S1-25 (adjust to negative direction) when idling until both upward and downward travel have no car slipping.**

   **Notes: S1-24 and S1-25 generally adopt same values, for example set as -60%.**

4. **H3-16=2$\times$(S1-24), for example set as 120%.**

# Appendix 2 Connection Diagram and Parameter Settings List of the Inverter Selected for Synchronous Motor Control

**1．Connection diagram and parameter settings list of yasukawa 676gl5-ip inverter**

**（1） Terminal connection diagram of the inverter**
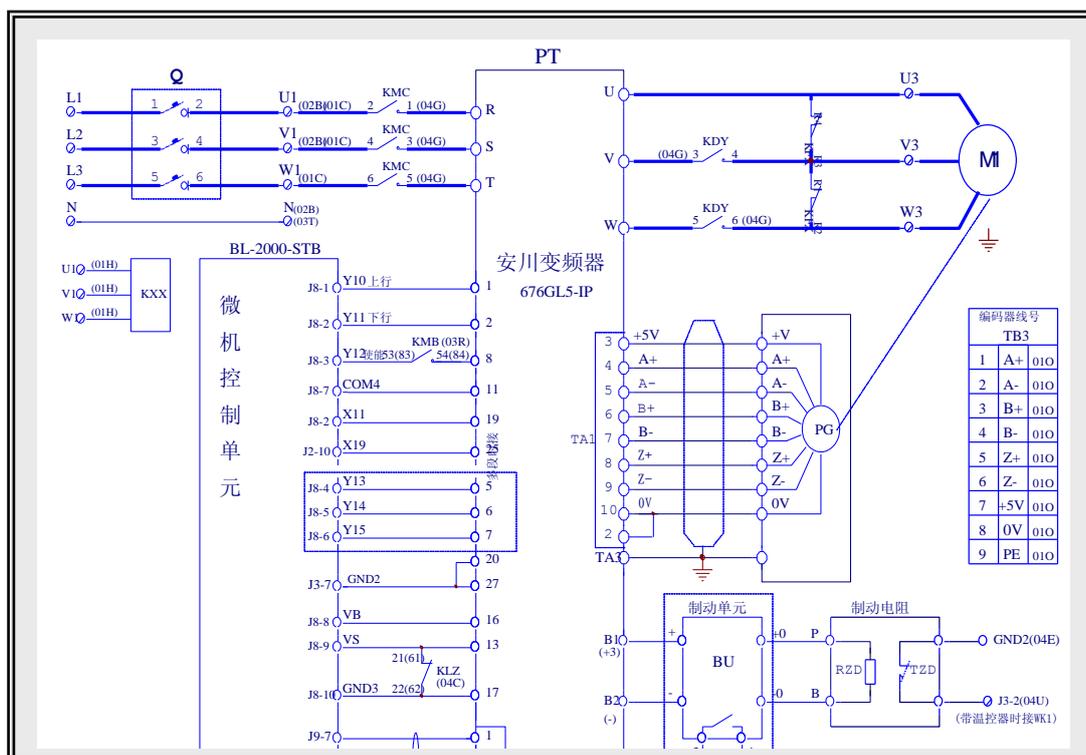


| 安川变频器 | YASKAWA inverter |
|---|---|
| 微机控制单元 | Computer control unit |
| 多段时接 | Connected in the case of multi speed |
| 编码器线号 | Encoder line number |
| 制动单元 | Brake unit |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connected to WK1 in the case of with thermostat |
| 注: 1) 括号内为富士接触器触点号，括号外为施耐德接触器触点号 | Note: the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor |

**（2） Key Instructions**

DRIVE/PRGM key: enter or exit setstate.

"＞" key: Select and reset.

"∧" and "∨" keys: change number.

DSPL key: return to previous menu and switch between the monitored items in running. 。

**（3） Setting**

◆ Initializing inverter parameters by using Initialization parameter A1-03=2220.

◆ Setting A1-01 to 686 and A1-04 to 686.

◆ Setting A1-02 to 5 and inverter to synchronous control mode.

◆ Setting inverter parameters according to the following table (for reference only): simulation + multi speed

| Parameter | Description | Setting value | Note |
|---|---|---|---|
| A1-06 | Input voltage | 380 | |
| O1-01 | Selection of monitored item | 1 | |
| O1-02 | Monitoring O1-01selection item | 4 | |
| O1-03 | Speed reference display unit | * | Poles number of motor |
| B1-01 | Speed reference selection | 1 | Set to "0" at multi speed |
| B1-02 | Running reference selection | 1 | |
| B1-03 | Stop method selection | 0 | |
| B1-04 | Inversion inhibit selection | 0 | |
| B2-01 | Zero speed level | 1 | |
| C1-01 | Ramp-up time 1 | 2 | |
| C1-02 | Ramp-down time 1 | 2 | |
| C1-03 | Ramp-up time 2 | 2 | |
| C1-04 | Ramp-down time 2 | 2 | |
| C2-01 | S-curve characteristic time at acceleration start | 0 | Set to 1.5 in the case of multi speed (for reference) |
| C2-02 | S-curve characteristic time at acceleration end | 2 | Set to 1.5 at multi speed (for reference) |
| C2-03 | S-curve characteristic time at deceleration start | 2 | Set to 1.5 in the case of multi speed (for reference) |
| C2-04 | S-curve characteristic time deceleration end | 0 | Set to 1.5 in the case of multi speed (for reference) |
| C5-01 | ASR proportional gain 1 | 5 | |
| C5-02 | ASR integration time 1 | 1 | |
| C5-03 | ASR proportional gain2 | 7 | |
| C5-04 | ASR integration time2 | 0.8 | |
| C5-08 | ASR filtering | 0 | |
| C5-09 | ASR switching speed | 30 | |
| D1-02 | Frequency reference2 | 0 | Self-learning speed in the case of multi speed (set according to actual need) |
| D1-03 | Frequency reference3 | 0 | Inspection traveling speed in the case of multi speed (set according to actual need) |
| D1-04 | Frequency reference4 | 0 | Creep speed in the case of multi speed (set according to actual need) |
| D1-05 | Frequency reference5 | 0 | Low speed in the case of multi speed (V1) (set according to actual need) |
| D1-06 | Frequency reference6 | 0 | Medium speed in the case of multi speed (V2) (set according to actual need) |
| D1-07 | Frequency reference7 | 0 | Medium speed in the case of multi speed (V3) (set according to actual need) |

| Parameter | Name | Setting value | Notes |
|---|---|---|---|
| D1-08 | Frequency reference8 | 0 | High speed in the case of multi speed (V4) (set according to actual need) |
| D1-09 | Inching reference | 200 | |
| E3-10 | Motor d (D) axis inductance | * | See nameplate |
| E3-11 | Motor q (Q) axis inductance | * | See nameplate |
| E3-12 | Induced voltage parameter of motor | * | See nameplate |
| E3-13 | Mechanical loss of motor | * | See nameplate |
| E3-14 | Connection resistance of motor | * | See nameplate |
| E3-18 | PG origin pulse compensation | * | Initiation of PG self-learning |
| E3-23 | Magnetic torque coefficient K1 | * | |
| E3-24 | Rated torque coefficient K2 | * | |
| E2-26 | De-vibration compensation loop effective | 1 | |
| E2-29 | Electrical mechanical time constant | 0.056 | |
| E2-30 | P value of compensation loop | 0.2 | |
| E2-31 | I value of compensation loop | 0.05 | |
| E2-32 | Filtering time constant 1 | 0.004 | |
| E2-33 | Filtering time constant 2 | 0.396 | |
| F1-01 | PG constant | * | Set according to coder |
| L5-01 | Abnormal reset and restart times | 5 | |
| L8-05 | Input-side lack-phase protection action selection | 1 | |
| L8-07 | Output-side lack-phase protection action selection | 1 | |
| H1-03 | Function selection of terminal 5 | F | Set to "3" in the case of multi speed |
| H1-04 | Function selection of terminal 6 | F | Set to "4" in the case of multi speed |
| H1-05 | Function selection of terminal 7 | 6 | Set to "5" in the case of multi speed |
| H1-06 | Function selection of terminal 8 | 9 | |
| H2-01 | Function selection of terminal 9 | 37 | |
| H2-02 | Function selection of terminal 25 | 37 | Set to "40" when using torque compensation |

| | | | |
|---|---|---|---|
| H3-01 | Level selection of terminal 13 | 0 | |
| H3-02 | Input gain of terminal 13 | * | Set according to analog voltage max and elevator speed |
| H3-03 | Input offset of terminal 13 | 0 | |
| H3-04 | Level selection of terminal 16 | 1 | |
| H3-05 | Function selection of terminal 16 | 14 | |
| H3-06 | Input gain of terminal 16 | 0 | |
| H3-07 | Input offset of terminal 16 | 0 | |
| H3-12 | Analog input filtering time | 0.02 | |
| S1-10 | Starting torque compensation offset for rising | 0 | |
| S1-11 | Starting torque compensation offset for descending | 0 | |
| S1-12 | Accelerated moment compensation filtering time | 0 | |
| S1-13 | Accelerated moment compensation gain | 0 | |

▲**Notes: upon finishing parameter setting, if the "OPE11" is displayed on frequency inverter, reduce parameter C6-04 at the interval of 2.**

（4） The inverter can get the parameters of motor according to the motor nameplate or through the self-learning. Firstly, set up the basic parameters of the motor: max speed of revolution, basic speed of revolution, number of poles, rated voltage and rated current, then observe the negative rotating (positive rotating) motor on Pulley side to see if the direction feedback from parameter U1-05 is positive, if not, change by negating parameter F1-02. Motor must be in no-load state when self-learning through:

◆ Setting the parameter T1-01 of inverter to 2 (full self-learning)
◆ Pressing DSPL key to return to T1-01 display
◆ Pressing DRIVE/PRGM key to display CAL 12
◆ Pressing RUN key to display CAL13 (flashing), motor is self-learning.
◆ Displaying END for about 2 seconds to automatically return to monitoring state to finish self-learning.
  To ensure the correctness of PG origin pulse compensation, PG origin pulse must conduct single-item self-learning at no load condition of motor through:
◆ Setting the parameter T1-01 of inverter to 3
◆ Press DSPL key to return to T1-01 display
◆ Press DRIVE/PRGM key to display CAL 12
◆ Pressing RUN to display CAL 13 (blink), inverter is self-learning
◆ Displaying END for about 2 seconds to automatically return monitoring state to finish self-learning
◆ Taking down parameter E3- 18, PG origin pulse compensation

（5） FAQ in trial running:

◆ Elevator jitters and speed is unstable. Please check the connection between rotation encoder and motor. If no connection problem, it may be because the poor performance of rotation encoder.
◆ Speed is too low. If the elevator is running in the direction as displayed on inverter but the speed feedback

value is not consistent with the speed given with great difference, please check if the parameters of the inverter are set correctly. The following table is given for your reference.

◆ No speed feedback. It may be because of the output damage of rotation encoder or the problem with the connecting cable.

| Yasakawa 676GL5-IP | | | |
|---|---|---|---|
| Rated voltage | E1-01 | Rated current of motor | E2-01 |
| Max output frequency | E1-04 | Slip frequency of motor | E2-02 |
| Max output frequency voltage | E1-05 | Motor poles | E2-04 |
| Basic frequency | E1-06 | Encoder pulse count | F1-01 |
| Inspection speed | D1-09 | | |

**▲Note: Do not let inverter drive motor to run for long when elevator can't run normally!**

2．**KEB F4 inverter connection diagram and parameter setting 3.0 version**

（1） **Terminal connection diagram of the inverter**
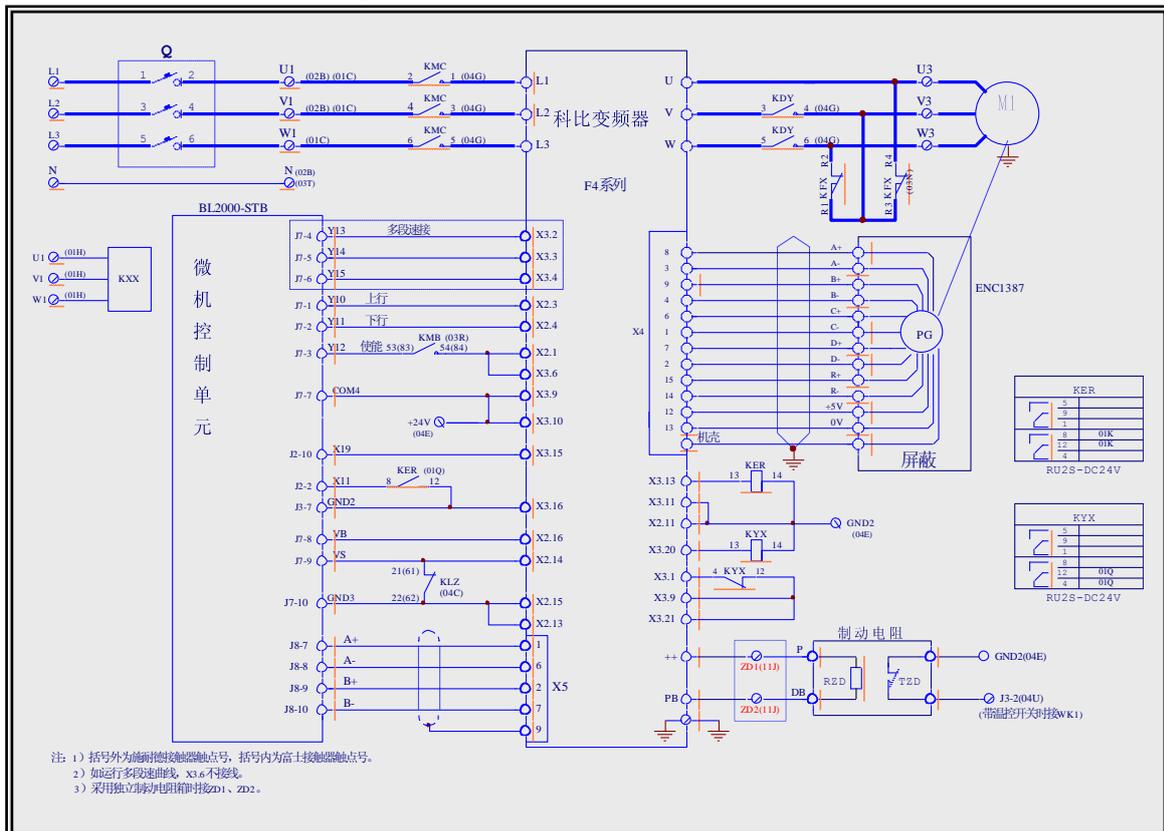


| 科比变频器 | KEB inverter |
|---|---|
| F4 系列 | F4 series |
| 多段速时接 | Connected in the case of multi speed |
| 上行 | Up |
| 下行 | Down |
| 使能 | Enable |
| 微机控制单元 | Computer control unit |
| 机壳 | Case |
| 屏蔽 | Shielded |

| 制动电阻 | Brake resistor |
|---|---|
| 带温控器时接 WK1 | Connect to WK1 in the case of with thermostat |

注: 1)括号内为富士接触器触点号, 括号外为施耐德接触器触点号

2) 如运行多段速曲线,X3.6 不接线.

Notes: 1) the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor.

2) Not connect X3.6 if running multi speed curve.

**(2) Set inverter parameters according to the following table (reference only):**

| Parameter | Description | Setting value | Note |
|---|---|---|---|
| dr.00 | Rated power of motor | * | See nameplate |
| dr.01 | Rated speed | * | See nameplate |
| dr.02 | Rated current | * | See nameplate |
| dr.03 | Rated frequency | * | See nameplate |
| dr.07 | Stator current | 1.1×dr.02 | See nameplate |
| dr.09 | Rated torque of motor | * | See nameplate |
| dr.17 | Opposing electromotive force | * | See nameplate |
| dr.41 | Winding resistance | * | See nameplate |
| dr.42 | Winding inductance | * | See nameplate |
| EC01 | Encoder pulse count | * | See nameplate |
| EC03 | Encoder pole-pairs | 0 | See nameplate |
| EC04 | System position adjustment | 7 | |
| EC06 | Encoder model class | 1 | |
| EC07 | System location | | |
| EC17 | Frequency division coefficient | 1 | |
| LF.00 | Password | -4 | |
| LF.01 | User password | 440 | |
| LF.02 | Operation mode | 3 | |
| LF.04 | Motor selection | 1 | |
| LF.05 | Operating direction adjustment | OFF | |
| LF.06 | High resolution | 1 | |
| LF.20 | Rated elevator speed | | Set up according to actual field parameters |
| LF.21 | Pulley diameter | | Set up according to actual field parameters |
| LF.22 | PM reduction ratio | OFF | Set up according to actual field parameters |
| LF.23 | Hoist rope reeving mode | 2 | Set up according to actual field parameters |
| LF.24 | Carrying capacity | | |
| LF.30 | Control mode | 3 | Speed feedback and pre-control torque |

| | | | closed loop |
|---|---|---|---|
| LF.36 | Max torque | Rated torque×1.5 | DR09×1.5 |
| LF.38 | Modulation frequency transformation | 0 | |
| LF.41 | Opening speed | 0.5 | 7.5kw |
| LF.44 | Opening speed | 0.5 | |
| LF.50 | Abrupt acceleration | 0.5 | |
| LF.51 | Acceleration | 1.5 | |
| LF.52 | Abrupt deceleration | 2.5 | |
| LF.53 | Deceleration | 2.0 | |
| LF.54 | Stop slope | OFF | |
| LF.60 | Braking speed | 0.010 | |
| LF.61 | Overspeed monitoring | 1.1×LF20 | |
| LF.62 | Deceleration monitoring | 0.010 | |
| LF.63 | Creeping monitoring | 0.25 | |
| LF.65 | Overheat delay time | 300 | |
| LF.66 | Radiator temperature monitoring | 40 | |
| LF.67 | Pre-torque gain | 1 | |
| LF.68 | Pre-torque offset | 0 | |
| LF.69 | Pre-torque direction | OFF | |
| LF.70 | Brake open time | 0.3 | |
| LF31 | Speed proportion | 1500 | Typical value |
| LF32 | Speed integrator | 125 | Typical value |
| LF33 | KI Speed-Offset | 1875 | Typical value |
| LF34 | Current proportion | 980 | Typical value |
| LF35 | Current integrator | 160 | Typical value |

**3．KEB F5 inverter diagram and parameter setting**

**（1）Terminal connection diagram of the inverter**
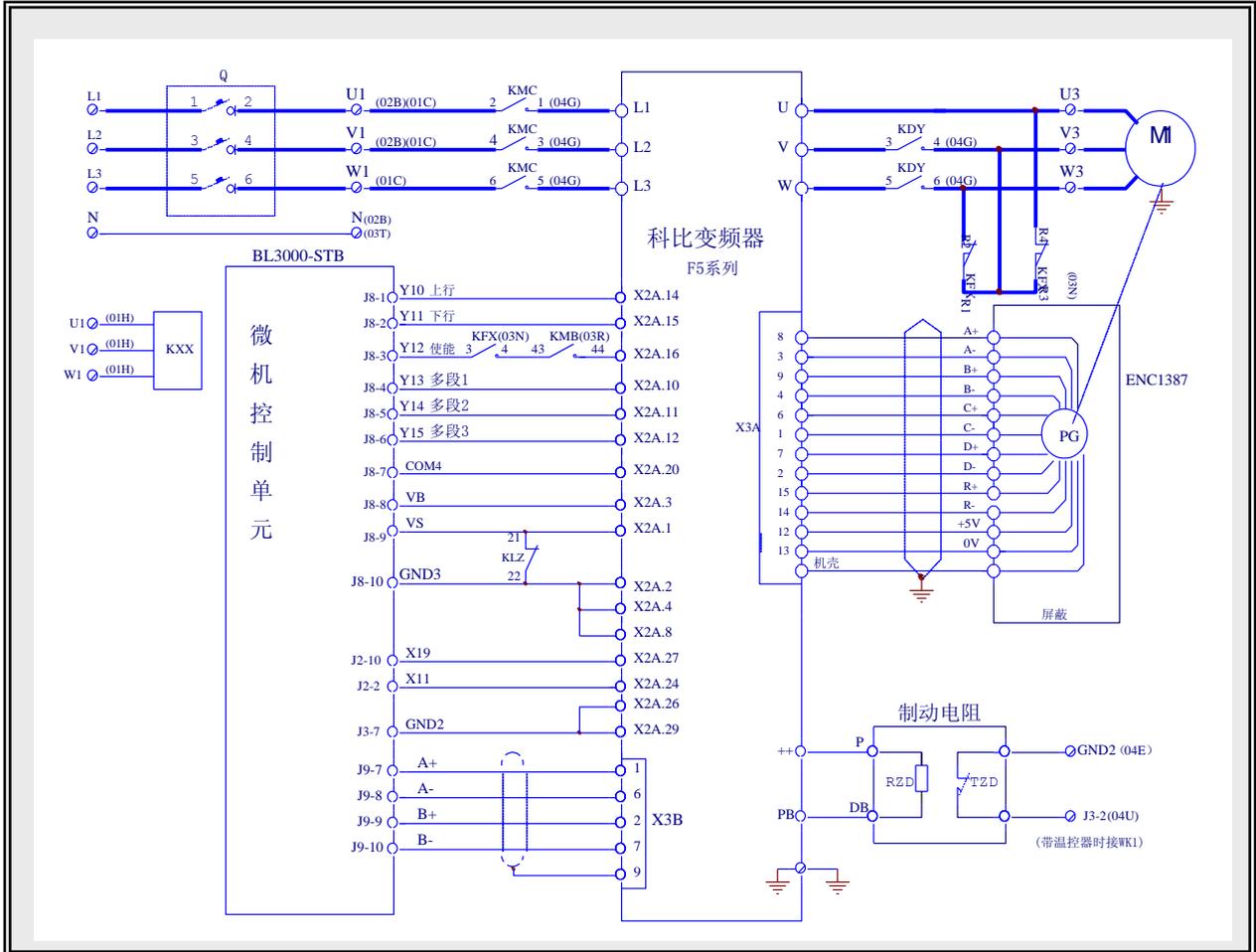


| 科比变频器 | KEB inverter |
|---|---|
| F5 系列 | F5 series |
| 上行 | Up |
| 下行 | Down |
| 多段 1 | Multi speed 1 |
| 多段 2 | Multi speed 2 |
| 多段 3 | Multi speed 3 |
| 使能 | Enable |
| 微机控制单元 | Computer control unit |
| 机壳 | Case |
| 屏蔽 | Shielded |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connect to WK1 in the case of with thermostat |

**（2）Set the parameters of inverter according to the following table (reference only): multi speed**

| Name | Parameter | hexadecimal address: | Recommended value |
|---|---|---|---|
| CP.0 | Password | 1000 | Read only |
| | | 2000 | Read-write |

| CP.1 | PM Rated Current | 0617 | See motor nameplate |
|------|------------------|------|---------------------|
| CP.2 | PM Rated Speed | 0618 | See motor nameplate |
| CP.3 | PM Rated Frequency | 0619 | See motor nameplate |
| CP.4 | PM EMF Voltage Constant | 061A | See motor nameplate |
| CP.5 | PM Rated Torque | 061B | See motor nameplate |
| CP.6 | PM Winding Resistance | 061E | See motor nameplate |
| CP.7 | PM Winding Inductance | 061F | See motor nameplate |
| CP.8 | PM Torque Limit(Torque limit ) | 0621 | |
| CP.9 | Motor Adaption | 090A | |
| CP.10 | abs. torque ref | 0F13 | |
| CP.11 | Speed V1 | 0P03 | |
| CP.12 | Speed V2 analog rated number | 0P03 | |
| CP.13 | Speed V3 | 0P03 | |
| CP.14 | Speed V4 | 0P03 | |
| CP.15 | Speed V5 | 0P03 | |
| CP.16 | Speed V6 | 0P03 | |
| CP.17 | Speed V7 | 0P03 | |
| CP.18 | S-Curve Time acc | 0P32 | 2.10S |
| CP.19 | Ramp-up time | 0P28 | 2.70S |
| CP.20 | S-Curve Time dec | 0P34 | 2.10 |
| CP.21 | Ramp-down time (Ramp-down time ) | 0P30 | 2.70S |
| CP.22 | Premagnetizing Time | 0423 | 1S |
| CP.23 | Brake Release Time | 0424 | 0.15S |
| CP.24 | Brake Engage Time | 0428 | 0.30S |
| CP.25 | Switching Frequency | 050B | 4KHZ |
| CP.26 | Encoder Pulse Number | 1001 | 2048Inc |
| CP.27 | Encoder Track Change | 1006 | 0: OFF |
| CP.28 | System Position | 1002 | 2206 |
| CP.29 | KP Speed | 0F06 | 2000 |
| CP.30 | KI Speed | 0F09 | 1500 |
| CP.31 | KI Speed-Offset | 0F0A | 3500 |
| CP.32 | KP Current | 1100 | Motor self-adapting |
| CP.33 | KI Current | 1101 | Motor self-adapting |
| | Indication Parameters only | | |
| CP.34 | Actual Speed(min$^{-1}$ ) | 0209 | |
| CP.35 | Apparent Current(A) | 020F | |
| CP.36 | Inverter State＝Start Display | 0200 | |

**Notes:    add the following parameters setting in the case of simulation set:**

| Name | Parameter | Recommended value | Notes |
|------|-----------|-------------------|-------|
| AN0 | Input voltage selection | 0 | 0～10V |
| AN1 | Analog collection times | 1 | 2 times |
| AN2 | Analog variable storage mode | 0 | Direct mode |
| AN4 | Zero lag | 0% | |

| AN5 | Analog 1 input increment | 1 | |
|------|------|------|------|
| AN6 | X-axis offset | 0 | |
| AN7 | Y-axis offset | 0 | |
| 0P.00 | Operation instruction selection | 0 | Analog curve |
| | | 2 | Multi speed given |

**(3) KEB F5 Self-learning:**

Step1:  CP.00:  enter 200, press Enter to confirm;

Step 2:  enter motor parameters

CP.01:  motor rated current, press Enter to confirm;

CP.02:  motor rated speed, press Enter to confirm;

CP.03:  motor rated frequency, press Enter to confirm;

CP.04: EMF per 1000 rotations, press Enter to confirm;

CP.05: motor rated torque, press Enter to confirm;

CP.06: motor winding resistance, press Enter to confirm;

CP.07: motor winding inductance, press Enter to confirm;

Step 3: motor self-adapting

CP.09: enter 1, press Enter to confirm;

Step 4: CP.26: encoder lines, press Enter to confirm

Step 5: system location

CP.28: enter 2206, press Enter to confirm;

Step 6: add "Enable";

Step 7: observe CP.35 until CP.35 value increase gradually from 0 to around the rated current and remain the same for around 30s, then self-learning is successful;

Step 8: disconnect "Enable";

Notes: During self-learning, if E.Enc fault alarm occurs, find the reason in the following three aspects:

（1）   Motor is not connected correctly, check the phase U, V and W connection of motor is strictly consistent with the phase U, V and W of inverter;

（2）   The number of encoder line is not correct, check CP.26,

（3）   Encoder cable is connected wrongly;

After correction, repeat Step 5 - 8,

Step 9: After self-learning is successful, set the corresponding speed in CP.11 - CP.17, then add "Enable", direction and speed to start up.

Step 10: CP.00: enter"100", press Enter to confirm, set CP parameters as Indication Parameters only to avoid rewriting without permission.

# 4．Fuji G11UD-4C4 inverter connection diagram and parameter setting table

## （1）Terminal connection diagram of the inverter

富士变频器
G11UD(同步)

BL3000-STB

编码器信号
TB3

| 1 | 5V |
| 2 | 0V |
| 3 | A- |
| 4 | A+ |
| 5 | B- |
| 6 | B+ |
| 7 | U- |
| 8 | U+ |
| 9 | V- |
| 10 | V+ |
| 11 | W- |
| 12 | W+ |
| 13 | PE |

微机控制单元

制动单元

制动电阻

接电机地

屏蔽
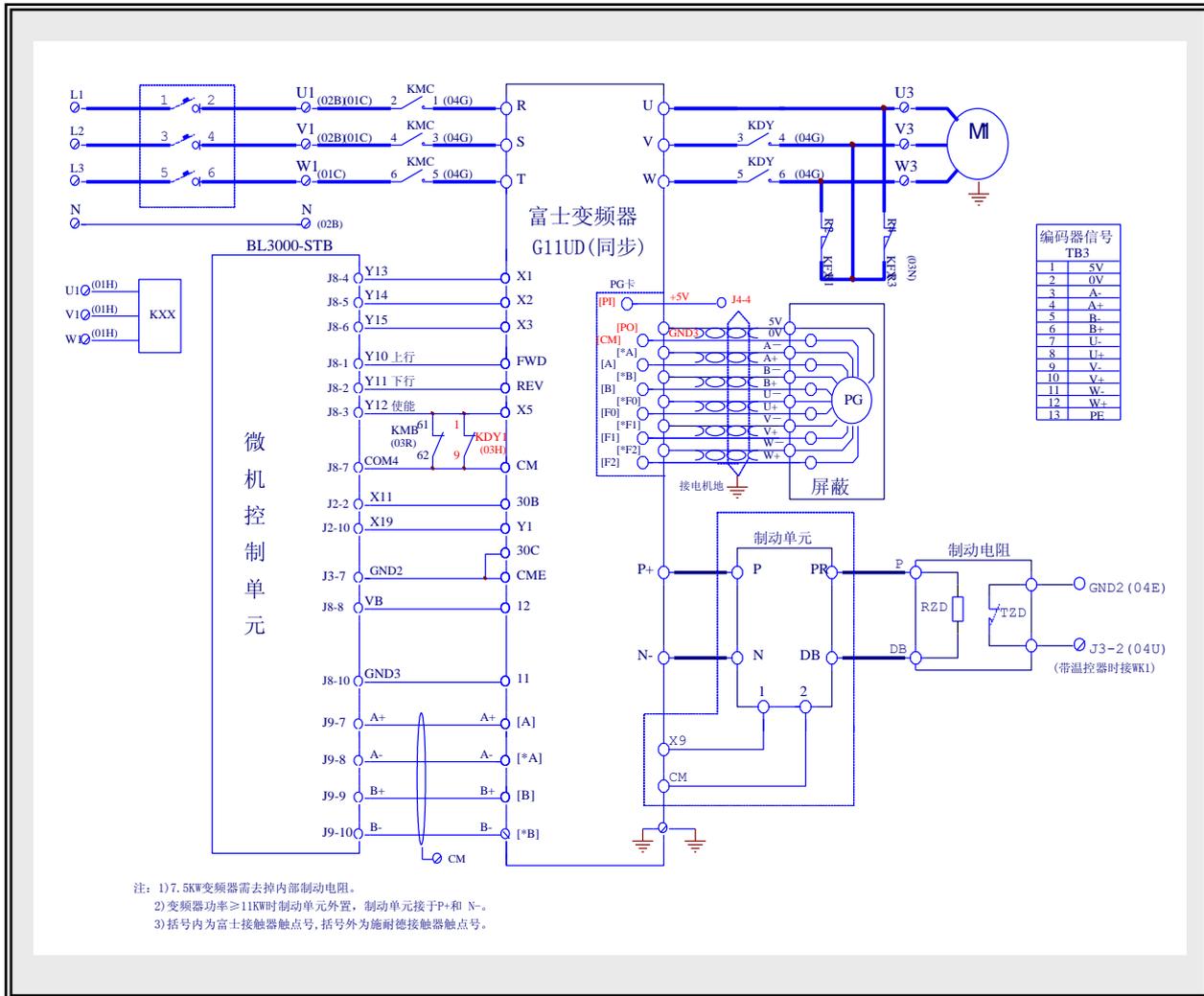
注：1)7.5KW变频器需去掉内部制动电阻。
2)变频器功率≥11KW时制动单元外置，制动单元接于P+和 N-。
3)括号内为富士接触器触点号，括号外为施耐德接触器触点号。

| 富士变频器 G11UD (同步) | Fuji inverter G11UD (synchronous) |
| 编码器信号 | Encoder signal |
| 上行，下行 | Up, Down |
| 使能 | Enable |
| 微机控制单元 | Computer control unit |
| 屏蔽 | Shielded |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connect to WK1 in the case of with thermostat |
| 注: 1) 7.5W 变频器需去掉内部制动电阻 | Notes:  1) The internal brake resistor of 7.5KW inverter needs to be removed. |
| 2) 变频器功率≥11KW时制动单元外置, 制动单元接于 P+和 N- | 2) when inverter power≥11KW, brake unit is external linked and connected to P+ and N- |
| 3)括号内为富士接触器触点号，括号外为施耐德接触器触点号 | 3) The number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor. |

## （2）Set up the parameters of inverter according to the following table (reference only): multi speed + analog

| Parameter | Description | Setting value | Note |
|---|---|---|---|
| F01 | Selection of frequency set | 0 | Set to 1 in the case analog set |
| F02 | Operation instruction selection | 1 | |
| F03 | Max output frequency 1 | * | See motor nameplate |
| F04 | Basic frequency 1 | * | See motor nameplate |
| F05 | Rated voltage 1 | 380 | See motor nameplate |
| F06 | Max voltage 1 | 380 | See motor nameplate |
| F07 | Ramp-up time 1 | 3.5S | Inspection Ramp-up time |
| F08 | Ramp-down time 1 | 1.00S | Inspection Ramp-down time |
| F15 | Frequency upper limit | * | Set up according to base frequency |
| F16 | Frequency lower limit | 0 Hz | |
| F23 | Start-up frequency | 0Hz | |
| F24 | Start-up frequency holding time | 0.5s | |
| F25 | Stop frequency | 0.1Hz | |
| F26 | Switching frequency | 15KHz | |
| △ F27 | Motor timbre | 0 | |
| F36 | 30Ry action mode | 0 | |
| △ F40 | Torque limit 1 (electric) | 200 | |
| △ F41 | Torque limit 1 (brake) | 200 | |
| E01 | X1 terminal function selection | 0 | |
| E02 | X2 terminal function selection | 1 | |
| E03 | X3 terminal function selection | 2 | |
| E05 | X5 terminal function selection | 7 | |
| E09 | X9 terminal function selection | 9 (4) | Set to 4 if less than 7.5KW, set to 9 if more than 11KW |
| E10 | Ramp-up time 2 | 3.5s | Medium speed Ramp-up time |
| E11 | Ramp-down time 2 | 2.5s | Medium Ramp-down time |
| E12 | Ramp-up time 3 | 3.5s | High Ramp-up time |
| E13 | Ramp-down time 3 | 2.0s | High Ramp-down time |
| E14 | Ramp-up time 4 | 11s | Stop Ramp-down time |
| E20 | Y1 terminal function selection | 0 | |
| E46 | Language | 1 | |
| C05 | Multi speed 1 | 2.5 Hz | Creeping speed |
| C06 | Multi speed 2 | 2.5 Hz | Inspection speed |

| Parameter | Description | Setting value | Note | |
|---|---|---|---|---|
| C07 | Multi speed 3 | 1.5 Hz | Leveling speed | |
| C08 | Multi speed 4 | * | Low speed (V4) | Set the speed at different sections according to various elevator speeds in light of SJT-WVF5-A elevator control system debugging and maintenance instruction. |
| C09 | Multi speed 5 | * | Medium speed 1 (V3) | |
| C10 | Multi speed 6 | * | Medium speed 2 (V2) | |
| C11 | Multi speed 7 | * | High speed (V1) | |
| C12 | Multi speed 0 | * | | |
| C31 | Analog input shift control | * | Field setting | |
| C33 | Analog input filtering time | 0.05 | Enter filtering to analog port 12 | |
| P01 | Motor poles | 20 | See motor nameplate | |
| P02 | Motor power | * | See motor nameplate | |
| P03 | Motor rated current | * | See motor nameplate | |
| P04 | Self-learning item | 0 | Self-learning is 3 | |
| P06 | Motor no-load current | 0 | Not set | |
| P07 | %R1 | 5 | | |
| P08 | %X | 10 | | |
| P09 | Motor rated slip | 0 | Not set | |
| H11 | Deceleration mode | 1 | | |
| H18 | Torque control selection | 3 | Enter with analog port 12 to conduct torque compensation | |
| O01 | Speed reference mode selection | 02 | PG is UVW type | |
| O02 | Speed reference filtering time constant | 0.020 | | |
| O03 | Encoder pulse count | 8192 | See the nameplate of encoder | |
| O04 | ASR P constant (high speed) | 5 | | |
| O05 | ASR I constant | 0.3 | | |
| O06 | Speed feedback filtering time constant | 0.003 | | |
| O07 | ASR P constant switching frequency 1 | 0 | | |
| Parameter | Description | Setting value | Note | |
| O08 | ASR P constant switching frequency 2 | 5 | | |
| O09 | ASR P constant (low speed) | 10 | | |
| O10 | Multi speed uniform timing | 0.005S | | |
| O11 | Emergency mode acceleration and Ramp-down time | 1.0 | | |
| O13 | S-curve setting 1 | 20 | S-curve at acceleration start | |

| O14 | S-curve setting 2 | 20 | S-curve at medium 1 (V3) and low (V4) acceleration end |
|---|---|---|---|
| O15 | S-curve setting 3 | 20 | S-curve at medium speed 1 (V3) and low (V4) deceleration start |
| O16 | S-curve setting 4 | 20 | S-curve at acceleration end |
| O17 | S-curve setting 5 | 20 | S-curve at medium declaration end |
| O18 | S-curve setting 6 | 20 | S-curve at high acceleration end |
| O19 | S-curve setting 7 | 16 | S-curve at high deceleration end |
| O20 | S-curve setting 8 | 18 | S-curve at deceleration end |
| O21 | S-curve setting 9 | 30 | |
| O22 | S-curve setting 10 | 30 | |
| O24 | Torque offset start-up timing | 0.2S | Actual field setting |
| O35 | Torque offset increment (electric) | 50% | Actual field setting |
| O36 | Torque offset increment (brake) | 50% | Actual field setting |
| O37 | Torque reference filtering time constant | 0.0 | |
| O38 | Start-up speed | 0.3 | |
| O53 | self-learning angle | 0~360 | |

**1. Self-learning angle description: set P04=3 and press DATA**

**2. Require the U, V, W of motor correspond to the U, V, W of the inverter**

**3. after self-learning for 5 times, observe the value of O53 to see that the error is not more than 20 degrees.**

**4. The current of test run is around 0.5A (without steel cable on the motor).**

**5. Power on repeatedly and when it goes normal after running for several times, make sure that self-learning is correct.**

**6. If there is OS, please check if the connection between the motor and inverter and between PG and inverter is correct.**

**5．Fuji FRENIC-LIFT inverter connection diagram and parameter setting table**

**(1) Terminal connection diagram of the inverter**

| 富士变频器 | Fuji inverter |
|---|---|
| 同步 | Synchronous |
| 编码器信号 | Encoder Signal |
| 接电机地 | Grounding motor |
| 微机控制单元 | Computer control unit |
| 屏蔽 | Shielded |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connect to WK1 in the case of with thermostat |
| 注：括号内为富士接触器触点号，括号外为施耐德接触器触点号 | Notes: the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor. |

**(2) Set up the parameters of inverter according to the following table (reference only): multi speed**

| Parameter | Description | Setting value | Note |
|---|---|---|---|
| F01 | Speed setting | 0 | Multi speed reference with S-curve acceleration and deceleration (SS1,SS2,SS4) |
| F03 | Max speed | * | See motor nameplate |
| F04 | Rated speed | * | See motor nameplate |
| F05 | Rated voltage | 380V | |
| F07 | Acceleration and Ramp-down time 1 | 3.5S | Low Ramp-up time |
| F08 | Acceleration and Ramp-down time 2 | 2.1S | Low Ramp-down time |
| F23 | Start-up speed | 0.4Hz | |
| F24 | Duration | 0.3s | |
| F25 | Stop time | 0.1Hz | |

| F42 | Control selection | 0 | Control with PG vector (asynchronous) |
|---|---|---|---|
| E01 | X1 terminal function selection | 0 | |
| E02 | X2 terminal function selection | 1 | |
| E03 | X3 terminal function selection | 2 | |
| E10 | Acceleration and Ramp-down time 3 | 3.5s | Medium speed Ramp-up time |
| E11 | Acceleration and Ramp-down time 4 | 2.5s | Medium speed Ramp-down time |
| E12 | Acceleration and Ramp-down time 5 | 3.5s | High Ramp-up time |
| E13 | Acceleration and Ramp-down time 6 | 2.0s | High Ramp-down time |
| E14 | Acceleration and Ramp-down time 7 | 11s | Creeping Ramp-down time |
| E18 | Multi speed reference uniform timer | 2 | |
| E19 | Multi speed reference uniform timer time | 0.010 | |
| E20 | Y1 terminal function selection | 35 | Inverter outputting |
| E27 | Terminal 30A/B/C (relay output) | 99 | Whole alarm |
| E48 | LED monitor details | 2 | Set speed |
| E61 | Terminal 12 (function selection) | 4 | Torque offset reference |
| C05 | Multi speed 1 | 8 | Terminal landing creep speed, unit: HZ |
| C06 | Multi speed 2 | 8 | Inspection speed |
| C07 | Multi speed 3 | 3 | Creep speed |
| C10 | Multi speed 6 | 30 | Medium speed |
| C11 | Multi speed 7 | 45 | High speed |
| C31 | Analog input shift control (terminal 12) | 0 | |
| C32 | Analog input gain control (terminal 12) | 100% | |
| C33 | Analog input filter adjustment (terminal 12) | 0.05s | |
| P01 | Motor poles | * | See motor nameplate |
| P02 | Motor capacity | * | See motor nameplate |
| P03 | Motor rated current | * | See motor nameplate |
| P06 | Motor no-load current | * | Set up according to default value |

| P12 | Motor rated slip | Note | |
|-----|------------------|------|---|
| L01 | Pulse programmer (option) | 0 | Phase A and B: 12 or 15V complement, open collector and 5V line drive |
| L02 | Pulse count | * | Set up according to actual configuration |
| L19 | S-curve setting 1 | 20 | S-curve at acceleration start |
| L22 | S-curve setting 4 | 20 | S-curve at medium acceleration end |
| L23 | S-curve setting 5 | 20 | S-curve at medium deceleration start |
| L24 | S-curve setting 6 | 20 | S-curve at high acceleration end |
| L25 | S-curve setting 7 | 16 | S-curve at high deceleration start |
| L26 | S-curve setting 8 | 18 | S-curve at deceleration end |
| L27 | S-curve setting 9 | 30 | |
| L28 | S-CURVE SETTING 10 | 30 | |
| L36 | P constant at high speed | 8 | |
| L37 | I constant at high speed | 0.5s | |
| L38 | P constant at low speed | 10 | |
| L39 | I constant at low speed | 0.5s | |
| L40 | Switching speed 1 | 5HZ | |
| L41 | Switching speed 2 | 10HZ | |
| L60 | Torque shift gain on drive side | 50％ | Actual field setting |
| L61 | Torque shift gain on brake side | 50％ | Actual field setting |
| | | | |
| | | | |

Notes: Motor rated slip freq. = basic freq. $\times$ $\dfrac{\text{Synch. Speed} - \text{rated speed}}{\text{Synch. Speed [r/min]}}$ [Hz]

Implementation of self-tuning:

1. Please set 1 or 2 in function code P04, and press DATA key (blink of 1 or 2 display will slow down)
2. Enter the operation instruction of the determined rotation direction.
3. The display of 1 or 2 will be lightened and self-tuning starts. (self-tuning time: when P04=1, max time is around 15secs)
4. Upon the ending of test, it will display "end".
5. Set the operation instruction to OFF, self-tuning finishes and the operation panel will display a function code (P06).

The after self-tuning motor constant will be saved automatically, that is, P07 for primary Resistance％R1, P08 for leakage reactance％X, P06 for no-load current and P12 for rated slip.

## 6．Fuji VG7S inverter connection diagram and parameter setting table

## (1) Terminal connection diagram of the inverter

富士变频器     VG7S     PT     BL3000-STB     微机控制单元
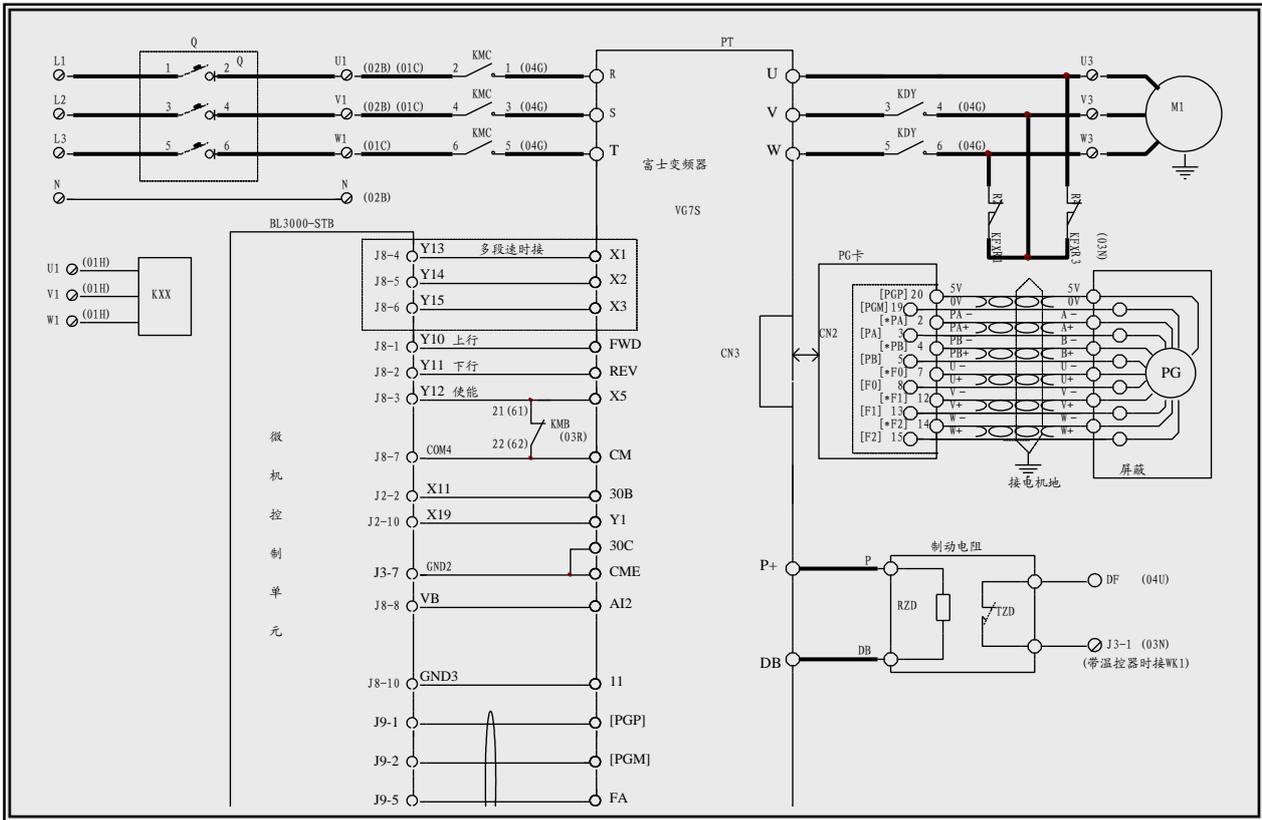
| 富士变频器 | Fuji inverter |
|---|---|
| 微机控制单元 | Computer control unit |
| 屏蔽 | Shielded |
| 编码器信号 | Encoder Signal |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connect to WK1 in the case of with thermostat |
| 注: 括号内触点为富士接触器 | Notes: the contact inside the brackets denotes the contact of Fujitsu Contactor |

## (2) Set the parameters of inverter according to the following table (reference only): multi speed

| Func.No | Name | Standard value | Setting value |
|---|---|---|---|
| C05 | Multi speed 1 | 0r/min | 24 |
| C06 | Multi speed 2 | | 0 |
| C07 | Multi speed 3 | 0r/min | 10 |
| C08 | Multi speed 4 | 0r/min | 0 |
| C09 | Multi speed 5 | 0r/min | 96 |
| C10 | Multi speed 6 | 0r/min | 153 |
| C11 | Multi speed 7 | 0r/min | 192 |
| C20 | Multi speed reference uniform timer | 0.00 | 0.02 |
| C35 | Ramp-up time JOG | 5.00S | 3 |
| C36 | Ramp-down time JOG | 5.00S | 3 |
| C46 | Ramp-up time 2 | 5.00S | 3 |
| C47 | Ramp-down time 2 | 5.00S | 3 |
| C56 | Ramp-up time 3 | 5.00S | 3.8 |
| C57 | Ramp-down time 3 | 5.00S | 3 |

| C67 | Ramp-down time 4 | 5.00S | 1 |
|---|---|---|---|
| E01 | X1 function selection | 0 | 0 |
| E02 | X2 function selection | 1 | 1 |
| E03 | X3 function selection | 2 | 2 |
| E04 | X4 function selection | 3 | 8 |
| E05 | X5 function selection | 4 | 7 |
| E15 | Y1 function selection | 1.00 | 0 |
| E16 | Y2 function selection | 2.00 | 1 |
| E17 | Y3 function selection | 3.00 | 4 |
| E18 | Y4 function selection | 4.00 | 5 |
| E29 | PG pulse output selection | 0.00 | 0 |
| E38 | Speed detection mode | 0.00 | 0 |
| E39 | Speed detection value 1 | 1500r/min | 24 |
| E49 | Ai1 function selection | 0.00 | 5(+-10v) |
| E55 | Ai1electric Gein | 1.00 | 2.8 |
| E56 | Ail brake Gein | 1.00 | 2 |
| E61 | Ai1 filter setting | 0.010s | 0.1 |
| E69 | AO1 function selection | 1 | 26    u-v |
| E70 | AO2 function selection | 6 | 31(O10) |
| E84 | AO1-5filter setting | 0.010s | 0.00 |
| F01 | Analog mode |  | 2 |
| F02 | Running and operation | 0 | 1 |
| F03 | M1 max speed | 1500    r/min | 192 |
| F04 | M1 rated speed | 1500    r/min | 192 |
| F05 | M1Rated voltage | Volume class V | 380 |
| F07 | Ramp-up time 1 | 5.00S | 3.5 |
| F08 | Ramp-down time 1 | 5.00S | 3 |
| F37 | Stop speed | 10.0r/min | 0.1 |
| F38 | Stop speed (detection mode) | 0 | 0 |
| F39 | Stop speed (zero-speed control duration) | 0.50s | 0.5 |
| F61 | ASR1-P (gain) | 10 | 10 |
| F62 | ASR1-1 (integrator constant) | 0.200s | 0.3 |
| F65 | ASR1 detection filter | 0.005s | 0.002 |
| F80 | Motor selection (M1.M2.M3) | 0 | 2    HT |
| H71 | self_- learning    ^+stop key | 0 | _5 |
| L03 | Lift rated speed | 100.0m/min | 120 |
| L04 | Fixed S-curve mode | 0 | 0 |
| L05 | S-curve setting    1 | 0.00% | 20 |
| L06 | S-curve setting    2 | 0.00% | 20 |
| L07 | S-curve setting    3 | 0.00% | 20 |
| L08 | S-curve setting    4 | 0.00% | 20 |
| L09 | S-curve setting    5 | 0.00% | 20 |

| | | | |
|---|---|---|---|
| L10 | S-curve setting 6 | 0.00% | 20 |
| L11 | S-curve setting 7 | 0.00% | 20 |
| L12 | S-curve setting 8 | 0.00% | 20 |
| L13 | S-curve setting 9 | 0.00% | 20 |
| L14 | S-curve setting 10 | 0.00% | 20 |
| O09 | ABS signal input definition (synchronous) | 0 | 1 |
| O10 | Magnetic pole position offset (synchronous) | 0 | * |
| O11 | Salient pole ratio (%Xq/%Xd) | | 1 |
| P01 | M1 control mode | 0 | 3 |
| P02 | M1 motor selection | Volume class | 37 |
| P03 | M1 rated capacity | Volume class | 13.4 |
| P04 | M1 rated current | Volume class | 30 |
| P05 | M1 poles | 4 | 20 |
| P06 | M1-%R1 | Volume class | 3.6 |
| P07 | M1-%X | Volume class | 22 |
| P08 | M1 exciting current | Volume class | 0.01 |
| P09 | M1 torque current | Volume class | 30 |
| P10 | M1 slip at drive | Volume class | 0.001 |
| P11 | M1 slip at brake | Volume class | 0.001 |
| P21 | M1 induced voltage coefficient | Volume class | 283 |
| P28 | M1-PG pulses | 1024 | 8192 |
| P30 | M1 thermal resister selection | 1 | 0 |
| | | | |

## 7．CT inverter connection diagram and parameter setting table

（1） **Terminal connection diagram of the inverter**
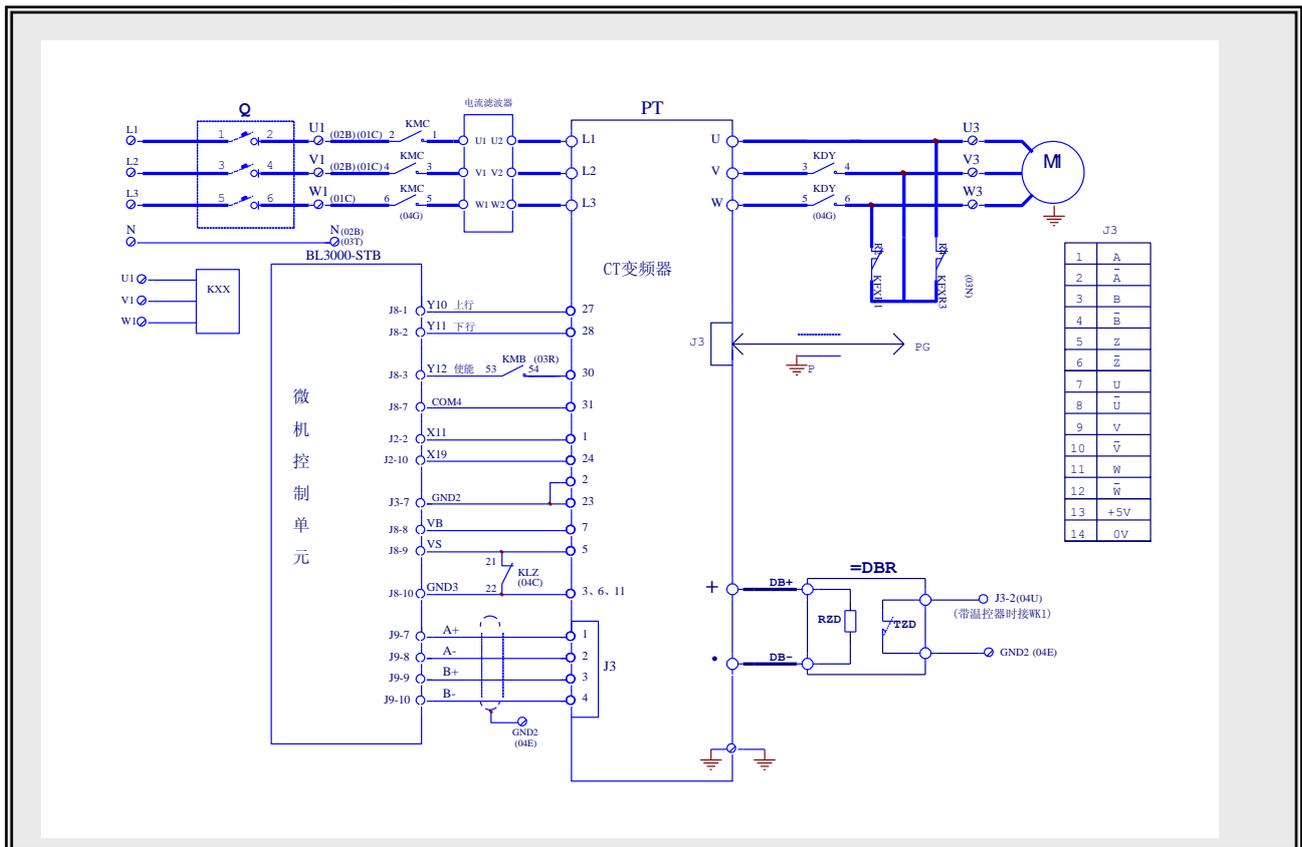
| 微机控制单元 | Computer control unit |
|---|---|
| 屏蔽 | Shielded |
| 编码器信号 | Encoder Signal |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connect to WK1 in the case of with thermostat |

**Set parameter #0.00=1255 and initialized inverter parameter.**

（2） **Set parameter #0.00=1253 and control mode #0.48 to SErUO, i.e. closed loop servo control mode.**

（3） **Set the inverter parameter according to the following table (for reference only: analog**

| Parameter | Description | Setting value | Remarks |
|---|---|---|---|
| #0.01 | Min frequency | 0 | |
| #0.02 | Max frequency (unit: rpm) | * | Rated speed of electrode |
| #0.03 | Acceleration | 0 | |
| #0.04 | Deceleration | 0 | |
| #0.05 | Speed set mode selection | 1 | Analog set 1 |
| #0.06 | Current limit | 175% | |
| #0.07 | KP speed | 6500 | Adjust according to actual situation |
| #0.08 | KI speed | 600 | Adjust according to actual situation |
| #0.10 | Feedback speed of electrode | * | For monitoring |
| #0.11 | Set before slope treatment | * | For monitoring |
| #0.12 | Set after ramp treatment | * | For monitoring |
| #0.13 | Active current of electrode | * | For monitoring |
| #0.15 | Slope mode selection | 1 (FAST) | |
| #0.16 | Stop mode selection (6.01) sp | coast | |
| #0.18 | S-curve enable (8.29=on) sp | 0 | |
| #0.42 | Motor poles | * | See motor nameplate |
| #0.43 | Motor COSΦ | 1.0 | |
| Parameter | Description | Setting value | Remarks |
| #0.44 | Motor rated voltage | * | See motor nameplate |
| #0.45 | Motor rated speed | * | See motor nameplate |
| #0.46 | Motor rated current | * | See motor nameplate |
| #0.47 | Motor rated frequency | * | |
| #1.10 | Forward and reverse enable | 1 | |
| #2.02 | Slope enable | 0 | |
| #3.05 | Zero speed definition | 0 | |
| #3.08 | OS threshold (0.26) sp | * | Rated speed of motor plus 20 |
| #3.21 | Encoder lines (0.27/0.34) sp | * | Set according to encoder lines |
| #3.23 | Encoder voltage selection (3.36) sp | * | 5V: set to 0; 15V: set to 1. |

| #4.08 | Torque set | * | Set by load detection device |
|---|---|---|---|
| #4.09 | Torque offset | * | Adjustment according to actual situation |
| #4.10 | Torque offset enable | 1 | |
| #4.11 | Torque mode selection | 4 | Note: set to 0 in the case of motor self-learning! |
| #4.15 | Motor thermal time constant | 89 | |
| #6.15 | Soft enable | 1 | |
| #7.06 | Analog voltage input mode | VOLT | |
| #7.07 | Analog input offset (7.30) sp | 0 | |
| #7.08 | Analog input calibration | 1 | Adjust according to actual situation |
| #7.10 | Analog mapped input | 1.36 | |
| #7.11 | Analog voltage input mode | VOLT | |
| #7.12 | Analog input calibration | 1 | |
| #7.14 | Analog mapped input | 4.08 | |
| #7.15 | Analog voltage input mode | VOLT | |
| #8.10 | F1 output source parameter | 10.02 | |
| #8.11 | F1 output phase reversal | 0 | |
| #8.12 | F1 output enable | 1 | |
| #8.27 | Logic input polarity selection | 0 | |
| #8.28 | Open collector output selection | 0 | |
| #10.34 | Auto reset times | 5 | |
| #10.35 | Auto reset interval | 0 | |

（4） **Motor PG origin self-learning method:**

After control cabinet is powered on normally and making sure the connection of encoder is correct, set the motor to no-load state and short-circuit the terminal J16-2 with terminal J16-1 on the main board (refer to page 4 of the Motor Schematic Diagram) and make contactor KDY pull-in. Refer to page 3 of Electric Schematic Diagram to short-circuit the proper terminals and make the brake (LZ) open, then short-circuit the control terminal 30 and 31 of inverter, set the parameter 0.40 to 1, then the motor will start slowly after confirming. When the 1 in the parameter 0.40 becomes to 0 automatically, self-learning finishes. Parameter stores in parameter 3.28. If self-learning suspends and the fault signal displays, please exchange any two phases of the motor after turning off the power and then restart the self-learning.

**8. SIEI inverter connection diagram and parameter setting table (multi speed)**

  **(1) Terminal connection diagram of the inverter**
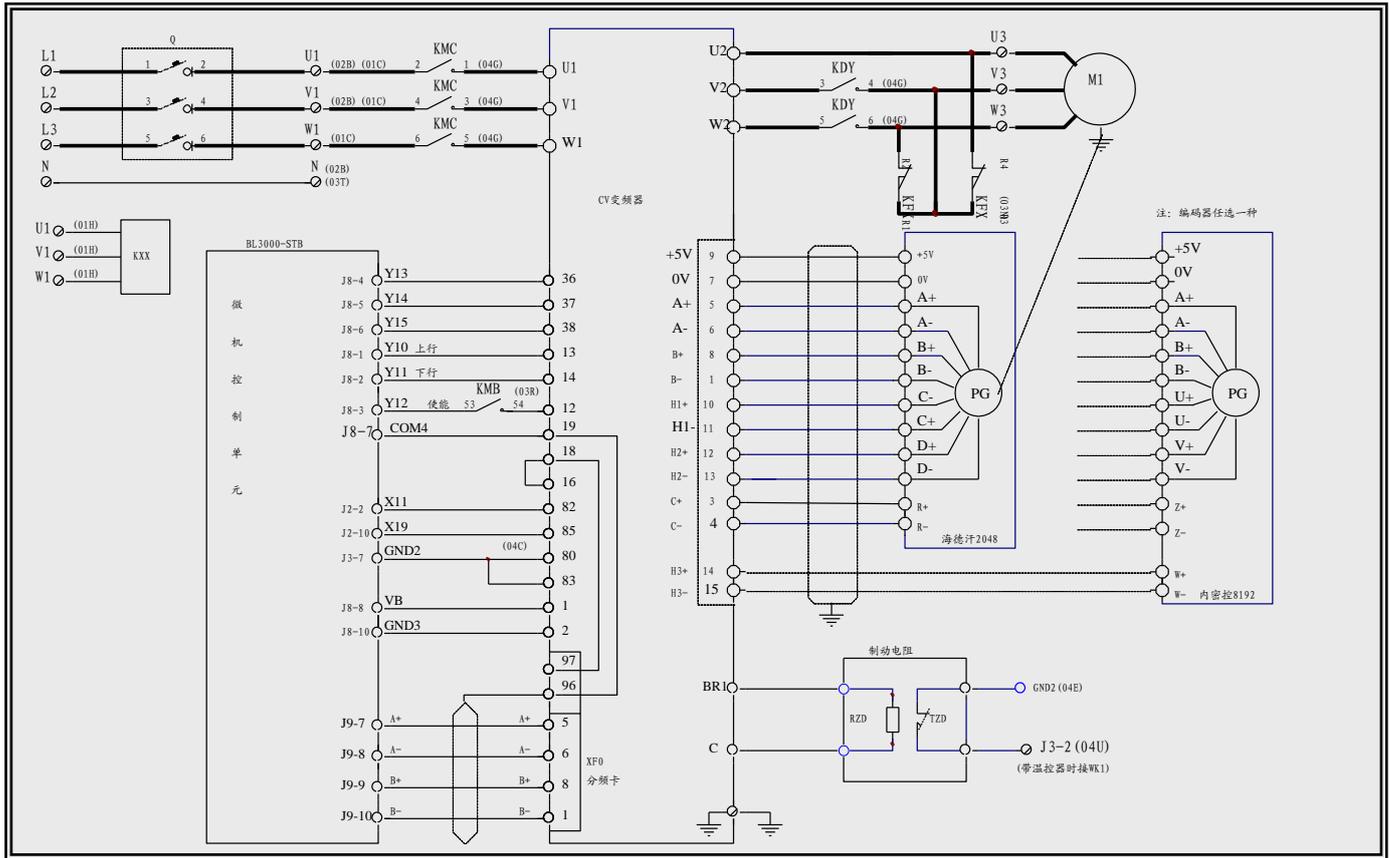
| CV 变频器 | CV inverter |
| 注：编码器任选一种 | Note: choose one encoder |
| 微机控制单元 | Computer control unit |
| 制动电阻 | Brake resistor |

**(2) The following parameters are only for your reference, please make adjustment according to actual situation:**

| Item | Terminal | | | Speed value |
|---|---|---|---|---|
| | **38** | **37** | **36** | |
| self-learning speed | 0 | 0 | 1 | 300mm/s |
| Inspection speed | 0 | 1 | 0 | 300mm/s |
| Creep speed | 0 | 1 | 1 | 50 mm/s |
| Speed 4 | 1 | 0 | 0 | 0 mm/s |
| Speed 3 | 1 | 0 | 1 | 0mm/s |
| Speed 2 | 1 | 1 | 0 | 1000mm/s |
| Rated speed $V_1$ | 1 | 1 | 1 | 1600mm/s |

**(3) Steps for adjustment**

◆ After finishing connection, check for the correct connection of the main loop and control loop of inverter to avoid the damage of inverter. Check for the correct connection of encoder and the U V W of the outlet line of inverter to the U V W of the motor line.

◆ Set the control mode as synchronous elevator control mode and short-circuit the terminal 19 with terminal 12 of the inverter and make the output contactor and brake contactor pull in to conduct the current

self-learning of hoist machine.

◆ After self-learning finishes, start the zero setting of encoder.

◆ After the above step finishes, set the parameters and start slow running.

◆ In the circumstance of slow running can go normally and elevator is operating normally, start the fast running of elevator to see if there is backward sliding and overshoot in the process of up run and down run. If backward sliding occurs, increase the function of pre-torque.

◆ When slow and fast running can both go normally, adjust the S-curve parameter and P, I parameters to adjust the comfort at high-speed running of the elevator.

## (4) General parameters of elevator

◆ Motor data

| Parameter | Setting value | Note |
|---|---|---|
| Rated voltage （Rated voltage） | 380V | |
| Rated current | 61.5A | * |
| Rated current | 234rpm | * |
| Pole pairs | 10 | |
| stator resistance | 0.8Ω | * |
| Stator inductance) | 0.020H | * |
| Torque constant | 18.210NM/A | * |
| EMF constant | 10.514 | * |

◆ Self-learning

Please refer to the current self-learning step of gearless motor that follows.

◆ Encoder zero setting

Please refer to the gearless motor magnetic orientation step that follows.

◆ Mechanical data

| Parameter | Setting value | Note |
|---|---|---|
| Travel unit reselection | Millimeters | |
| Gearbox ratio | 2 | |
| Pulley diameter | 410mm | * |
| Full scale speed | 150rpm | * |

◆ Weights

| Parameter | Setting value | Note |
|---|---|---|
| Cabin weight | 2100kg | * |
| Counter weight | 2900kg | * |
| Load weight | 1600kg | * |
| Rope weight | 300kg | * |
| Motor inertia | 5.0 | * |
| Gearbox inertia | 0.0 | * |

◆ Encoders config

| Parameter | Setting value | Note |
|---|---|---|
| Encoder type | 0 (Std encoder) | |
| Std enc type | 4 (Sinusoidalsincos) | |
| Std enc pulses | 2048pps | |

| Std dig enc mode | 0 (FP) | |
|---|---|---|
| Std enc supply | 0 (5.14V) | |

◆ BU protection

| Parameter | Setting value | Note |
|---|---|---|
| BU control | 1 (internal) | |
| BU resistance | 15Ω | * |
| BU resistance | 8.0KW | * |

◆ Regulation mode

| Parameter | Setting value | Note |
|---|---|---|
| Regulation | 4 (Brushless) | |

◆ Speed profile

| Parameter | Setting value | Note |
|---|---|---|
| Smooth start spd | 5mm/s | |
| Self-learning speed (Multi speed1) | 300mm/s | |
| Inspection speed (Multi speed2) | 300mm/s | |
| Creep speed (Multi speed3) | 50 mm/s | |
| Speed 4 (Multi speed4) | 0mm/s | |
| Speed 3 (Multi speed5) | 0mm/s | |
| Speed 2 (Multi speed6) | 1000mm/s | |
| Rated speed (Multi speed7) | 1600mm/s | |

◆ Ramp profile

| Parameter | Setting value | Note |
|---|---|---|
| MR0 acc ini jerk | 300 mm/s$^3$ | |
| MR0 acceleration | 600 mm/s$^2$ | |
| MR0 acc end jerk | 500 mm/s$^3$ | |
| MR0 dec ini jerk | 500 mm/s$^3$ | |
| MR0 deceleration | 600mm/s$^2$ | |
| MR0 dec end jerk | 500mm/s$^3$ | |
| MR0 end decel | 200mm/s$^2$ | |

◆ Lift sequence

| Parameter | Setting value | Note |
|---|---|---|
| Cont close delay | 304ms | |
| Brake open delay | 416ms | |
| Smooth start dly | 400ms | |
| Brake close dly | 3000ms | |
| Cont open delay | 200ms | |

◆ Speed reg gains

| Parameter | Setting value | Note |
|---|---|---|
| SpdP1      gain% | 20% | |

| Spdl1 | gain% | 3.3% | |
|---|---|---|---|
| SpdP2 | gain% | 20% | |
| Spdl2 | gain% | 5% | |
| SpdP3 | gain% | 25% | |
| Spdl3 | gain% | 12% | |
| Sped 0 | enable | 2 (Enable as start) | |
| Sped 0 P gain% | | 19% | |
| Sped 0 I gain% | | 20% | |
| Prop filter | | | |

◆ Speed threshold

| Parameter | Setting value | Note |
|---|---|---|
| Spd 0 ref thr | 1rpm | |
| Spd 0 ref delay | 3000ms | |
| Spd 0 speed thr | 1rpm | |
| Spd 0 spd delay | 3000ms | |
| SGP tran21 h thr | 94% | |
| SGP tran32 l thr | 5% | |
| SGP tran21 band | 4% | |
| SGP tran32 band | 4% | |

◆ Inertia compensate

| Parameter | Setting value | Note |
|---|---|---|
| Inertia comp en | 1 (Enable) | |

◆ Speed regulator

| Parameter | Setting value | Note |
|---|---|---|
| SpdP base value | 50A/rpm | |
| SpdI base value | 8000A/rpm | |

◆

| Parameter | Setting value | Note |
|---|---|---|
| TRAVEL\Ramp function | Default | |
| TRAVEL\Ramp setpoint | Default | |
| TRAVEL\ Speed setpoint | Default | |

**Note: set the parameters marked with * according to actual situation.**

(5) **Steps for gearless motor current self-learning**

◆ Enter STARTUP/SETUP MODE/Autotune/Complete still;

◆ Open brake KDY when displaying Press I key, press the STAR key of inverter after giving enable and direction;

◆ Cancel enable and direction upon displaying END;

◆ Execute Load setup.

(6) **Steps for gearless motor magnetic field positioning**

◆ Enter REGULATION PAPAM\Flux config\Magnetiz config\Autophasing menu;

◆ Under the condition of having no steel cable, pull in KDY, enable, and make brake pull in, then press Enter;

◆ Give enable and direction when inverter displays "Waiting start……";

◆ When inverter displays "Autophasing End", cancel enable and direction, close KEY and brake;

◆ Execute Save config.

**(7) Gearless motor magnetic orientation operation**

◆ **Open brake by means of BL3000-STB and KDY, give enable and direction to conduct motor self-learning:**

◇ Properly seal the door lock and emergency stop, change the input type of X19 in Inspection state;

◇ Inverter enters self-learning to wait for KDY, brake, enable and direction state;

◇ Change the input type of X1, BL2000-STB main board will output KDY, brake, enable and direction state;

◆ After self-learning finishes, it will restore the input type of X1 and then that of X19.

## 9. Connection diagram and parameter setting table for the yaskawa l7b inverter (multi speed)

**(1) Terminal connection diagram of the inverter**
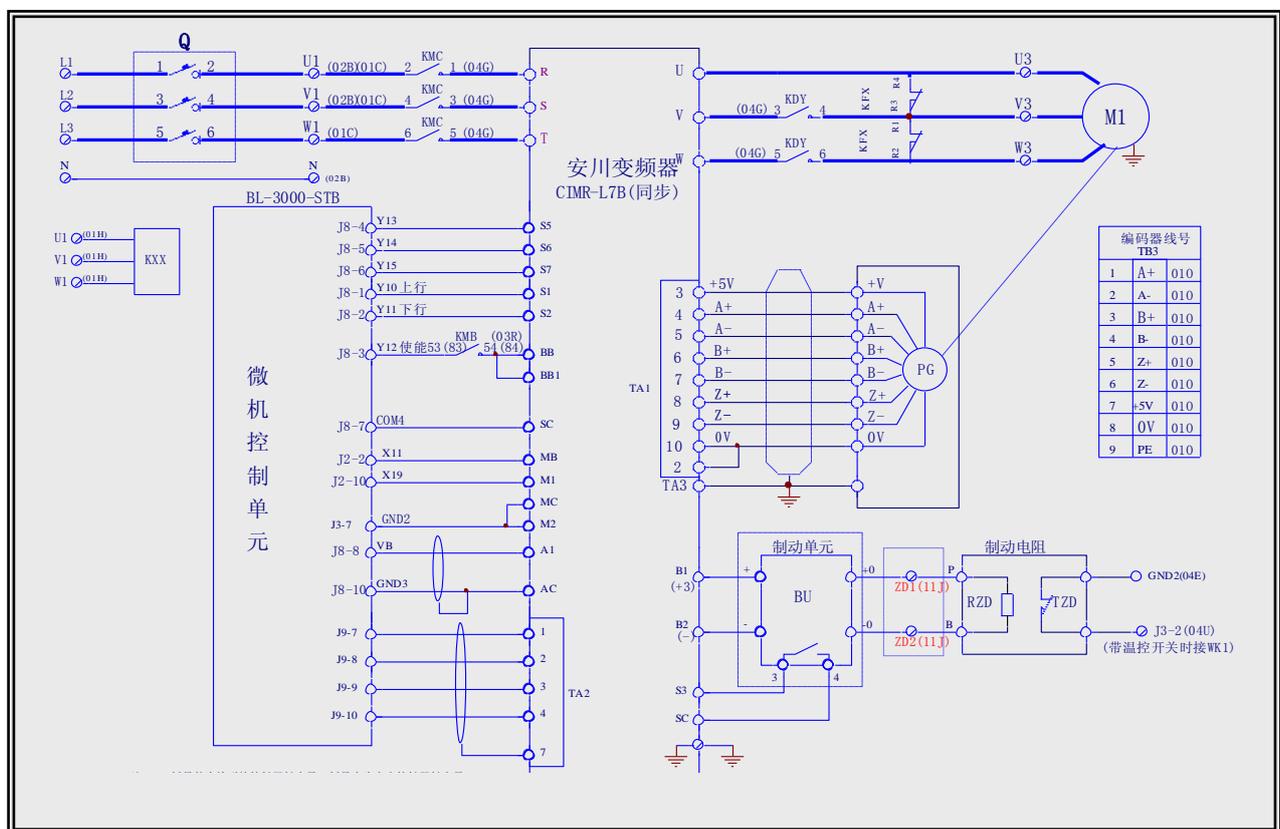


| 安川变频器 | Yaskawa inverter |
| 编码器线号 | Synchronous |
| 注：编码器任选一种 | Note: choose one encoder |
| 微机控制单元 | Computer control unit |
| 制动电阻 | Brake resistor |
| 带温控器时接 WK1 | Connected to WK1 in the case of with thermostat |

(2) First, set the parameter of "Control Mold" to A1-02=6

(3) Then use "Initialization" parameter A1-03=2220 to initialize the parameters of inverter.

(4) Set the parameters of inverter according to the following table (reference only for multi speed), set o1-03=Motor poles, o1-04=1 will display rotation number.

| Parameter | Description | Setting value | Remarks |
|-----------|-------------|---------------|---------|
| A1-00 | Digital operator displays language selection | 0 | English (default) |
| A1-01 | Parameter access level | 2 | ADVANDCED |
| A1-02 | Control mode selection | 6 | PM vector with PG |
| B1-01 | Frequency reference selection | 0 | Digital operator |
| B1-02 | Running reference selection | 1 | Control loop terminal (sequential control) |
| B1-03 | Stop selection | 1 | Free running stop |
| B1-06 | Control terminal two-time read time selection | 0 | 2ms |
| C1-01 | Ramp-up time 1 | 2 | Set in Second Ramp-up time from 0% to 100% of max output frequency |
| C1-02 | Ramp-down time 1 | 2 | Set in Second Ramp-down time from 100% to 0% of output frequency |
| C1-08 | Ramp-down time 4 | 3～5 | Ramp-down time at the frequency below C1-11 |
| C1-11 | Acceleration and Ramp-down time switching frequency | * | Consistent with d1-04 setting |
| C2-01 | S-curve characteristic time at acceleration start | 0.7 | |
| Parameter | Description | Setting value | Remarks |
| C2-02 | S-curve characteristic time at acceleration end | 0.7 | |
| C2-03 | S-curve characteristic time at deceleration start | 0.7 | |
| C2-04 | S-curve characteristic time deceleration end | 0.7 | |
| C5-01 | ASR proportional gain 1 | 10 | |
| C5-02 | ASR integration time1 | 0.35 | |
| C6-11 | Carrier frequency selection | 4 | |
| d1-02 | Frequency reference 2 | 0 | Self-learning speed (Set up according to actual need) |
| d1-03 | Frequency reference 3 | 15 | Inspection running speed (Set up according to actual need) |
| d1-04 | Frequency reference 4 | 6 | Creep speed (Set up according to actual |

| | | | need) |
|---|---|---|---|
| d1-05 | Frequency reference 5 | * | Low speed (V1) (Set up according to actual need) |
| d1-06 | Frequency reference 6 | * | Medium speed 1 (V2) (Set up according to actual need) |
| d1-07 | Frequency reference 7 | * | Medium speed 2 (V3) (Set up according to actual need) |
| d1-08 | Frequency reference 8 | * | High speed (V4) (Set up according to actual need) |
| E1-01 | Inverter input voltage | 380 | Unit: V |
| E1-04 | Max output frequency/rotation number | * | Sam as E1-06 |
| E1-05 | Max voltage | * | See motor nameplate |
| E1-06 | Basic frequency/rotation number | * | See motor nameplate |
| E1-09 | Min output frequency/rotation number | 0 | |
| E5-02 | Motor rated capacity | * | See motor nameplate, take note of unit |
| E5-03 | Motor rated current | * | See motor nameplate, take note of unit |
| E5-04 | Motor poles | * | See motor nameplate |
| E5-05 | Motor armature resistance | * | Set up according to the results of motor self-learning |
| E5-06 | Motor d axis inductance | * | Set up according to the results of motor self-learning |
| E5-07 | Motor q axis inductance | * | Set up according to the results of motor self-learning |
| E5-09 | Motor induced voltage parameter | * | Set up according to the results of motor self-learning |
| E5-11 | PG origin pulse compensation | * | Set up according to the results of motor self-learning |
| F1-01 | PG parameter | * | Set up according to the encoder actually installed |
| F1-02 | PG wire break detection action selection | 1 | |
| F1-03 | Action selection in the case of overspeed | 0 | Ramp to stop according to C1-02 time |
| F1-04 | Action selection in the case of DEV | 0 | Ramp to stop according to C1-02 time |
| F1-08 | Overspeed detection value | 105 | |
| F1-09 | Overspeed detection time | 1.0 | |
| F1-10 | DEV detection value | 30 | |
| F1-11 | DEV detection time | 1.0 | |
| H1-01 | Terminal S3 function selection | 24 | Multifunctional contact input 1 |
| H1-02 | Terminal S4 function selection | 14 | Multifunctional contact input 2 |
| H1-03 | Terminal S5 function selection | 3 | Multifunctional contact input 3 |
| H1-04 | Terminal S6 function selection | 4 | Multifunctional contact input 4 |
| H1-05 | Terminal S7 function selection | 5 | Multifunctional contact input 5 |

| Parameter | Description | Setting value | Remarks |
|---|---|---|---|
| H2-01 | Terminal M1-M2 function selection | 37 | |
| H3-15 | Terminal A1 function selection | 1 | Torque compensation |
| H3-16 | Terminal A1input gain | 120% | Set up according to actual field setting |
| H3-17 | Terminal A1input offset | 0 | |
| L3-04 | Antistall function selection in deceleration | 0 | |
| L8-07 | Output side lack-phase protection selection | 1 | |
| o1-01 | Drive mode display item selection | 5 | Select the monitored item number that needs to be displayed in drive mode |
| o1-02 | Monitored display item selection when power is ON | 1 | Set up monitoring frequency reference, |
| o1-03 | Frequency reference setup/display unit selection | * | Set up according to motor poles |
| o1-04 | Frequency reference parameters setup unit | 1 | Display rotation |
| S1-20 | Zero-servo gain | * | Set up according to field setting |
| S1-24 | Up-run torque compensation offset | -60% | Set up according to actual field setting |
| S1-25 | Down-run torque compensation offset | -60% | Set up according to actual field setting |

**\*The methods to adjust the start-up torque compensation are as follows:**

1. **Parameter H3-15=1, simulation input terminal A1 0～10V.**
2. **Parameter H3-17=0**
3. **Adjust parameter S1-24 and S1-25 (adjust to negative direction) until no sliding at both up run and down run.**
   i. **Note: S1-24 and S1-25 use the same value (e.g. set as -60%)**
4. **H3-16=2×(S1-24), e.g. set as 120%.**

# Appendix 3 Reference list of fault codes

## 1. List of system fault codes

| Fault Code | Description | Treatment Method |
|---|---|---|
| Er2 | Door interlock fault: door interlock circuit is opened in the running of elevator | Check the interlock circuit and if the cam is scratching the sheave. |
| Er3 | Inverter fault | Check the fault code of the inverter and confirm the reason. |
| Er4 | Elevator direction is opposite to the instructed direction: a. the pulses of A and B phases of main board are reverse; b. elevator runs in reverse direction. | (1) Exchange the pulses of A and B phases of the main board; (2) Change the phase sequence of the motor. |
| Er5 | Break on fault: after the system outputs the braking on instruction, it receives the feedback signal of the braking inspection switch. | (1) Check braking inspection switch and connections. (2) If there isn't switch, set the braking feedback inspection enable to be No. |
| Er6 | Landing input signal doesn't open in running | Check the signal circuit and inducing switch. |
| Er7 | The number of encoder pulses inspected by the main board in running is too small. | Check pulse input circuit of main board and connection of encoder |
| Er9 | KDY fault: the input KDY action instruments are not in accordance with the feedback result. | Check KDY output and feedback circuit as well as the KDY contactor. |
| Er10 | emergency stop circuit are opened | Check the emergency stop circuit. |
| Er11 | Landing missing: the running distance of elevator exceeds the distance between two floors, but the elevator doesn't inspect the landing input signal | Check the landing signal circuit and the inducing switch. |
| Er12 | Exceed the upper limit | Check the encoder or the relative circuits. |
| Er13 | Exceed the lower limit | Check the encoder or the relative circuits. |
| Er14 | Floor counter error: after the fault, the elevator will run to the bottom floor and correct the position | （1）Check the encoder or the relative circuit; （2）Check the landing circuit; （3）The typical faults: the beginning of the landing is tingled or any rope slides. |
| Er17 | after the main board outputs the instruction, it doesn't receive the inverter running signal | (1) Check inverter direction; enable signal, and running signal output circuit. (2) Check the relative parameters setting of the inverter. |
| Er18 | Floor number counting error: after the fault, the elevator will run to the bottom floor and correct the position | Check the encoder or the relative circuit; |
| Er19 | The distance to target floor is not enough and speed can not be changed normally; hoistway self-learning can not completed after the terminal landing installing position changed. | 1. Decrease the running speed for single floor, reduce the speed changeover distance; 2. Complete the hoistway self-learning |
| Er20 | When the elevator runs to the top floor and changes speed, the running speed decreases; hoistway self-learning can not completed after the terminal landing installing position changed. | 1. Increase the proportional parameter of inverter; check the matching of the braking resistance 2. Slow down the running curve; 3. Perform hoistway self-learning. |
| Er21 | Running time over setting time | (1) check the relative inverter parameters setting (2) check whether steel wire slides or car is blocked; (3) Check the setting value of item Over Time. |
| Er22 | Inspection signal input at high running | Check the inspection switch and the relative circuit. |
| Er23 | One of two landing input signals is invalid | Check the signal and the inducing switch. |

| Er24 | When given in multi-speed mode, speed change distance is too short. | Set the reasonable speed changeover distance according to the running speed |
|---|---|---|
| Er25 | Thermal switch protection, brake resistor or motor overheating | Check the thermal switch circuit. |
| Er26 | Door interlock fault, the condition of contact of interlock contactor is inconsistent with that of the winding | Check the conditions and the main board as well as the corresponding input terminal |
| Er27 | Emergency stop fault; the states of contact of the emergency stop contactor and coil are not the same | Check the conditions and the main board as well as the corresponding input terminal |
| Er28 | The upper and lower terminals or the second top and the second bottom terminals are adhered | The relative terminal landing is not valid at the installing floor, check the terminal landing signal |
| Er29 | Over large communication interference protection (system or parallel communication) | 1. inspect grounding of the system to solve the interference;<br>2. Check the damage of the calling board or the operating board which can damage the CAN communication bus. |

## 2. List of hoistway self-learning fault codes

| Fault No. | Description | Treatment Method for Reference |
|---|---|---|
| LER=0 | System running protection | Strike 'Esc', check fault record. Find the treatment according to the Appendix 3. |
| LER=1 | Reverse pulse input | Adjust the phase sequence of pulse input. Exchange A phase and B phase. |
| LER=2 | Bottom terminal 1 input repeat | Bottom terminal 1 is installed incorrectly; therefore some terminal signal inputs or Bottom terminal 1 is tingled. Check the installation of bottom terminal 1. |
| LER=3 | Bottom terminal 1 lost (>2.0m/s) | Bottom terminal 2 arrives before bottom terminal 1 or bottom terminal 1 lost; Check the installation of bottom terminal 1. |
| LER=4 | Bottom terminal 2 input repeat (>2.0m/s) | Bottom terminal 2 is installed incorrectly; therefore some terminal signal inputs or Bottom terminal 2 is tingled. Check the installation of bottom terminal 2. |
| LER=5 | Bottom terminal 2 lost (>2.0m/s) | Top terminal 2 arrives before bottom terminal 2 or bottom terminal 2 lost; Check the installation of bottom terminal 2. |
| LER=6 | Top terminal 2 input repeat (>2.0 m/s) | Top terminal 2 is installed incorrectly; therefore some terminal signal inputs or top terminal 2 is tingled. Check the installation of top terminal 2. |
| LER=7 | | |
| LER=8 | Top terminal 2 lost (>2.0 m/s) | Top terminal 1 arrives before top terminal 2 or top terminal 2 lost; Check the installation of top terminal 2. |
| LER=9 | Bottom terminal 1 lost | Top terminal 1 arrives before bottom terminal 1 or bottom terminal 1 lost; Check the installation of top terminal 1. |
| LER=10 | Top terminal 1 input repeat | Top terminal 1 is installed incorrectly; therefore some terminal signal inputs or top terminal 1 is tingled. Check the installation of top terminal 1. |
| LER=11 | Top terminal 1 lost | Top limit is arrived before top terminal 1 or top terminal 1 lost; Check the installation of top terminal 1. |
| LER=12 | Learn No. of total floors error | Check whether the total floor setting is in accordance with the actual floor; check whether the sight guard of the landing is lacked or whether the landing switch is sheltered by the baffle plate. |

| LER=14 | Two landing switches without overlap | The sight guard can not shelter the two landing switches (check the installation of the landing switch) or one switch is lost. |
|---|---|---|
| LER=15 | Push **Esc** to cancel learning | Pressing **Esc** key to cancel learning during the learning process. |
| LER=17 | Landing 1 and 2 input at the same time | The conducting wires of the two landing switch are installed incorrectly to be parallel, or bottom limit is nearby the leveling position of one floor. |
| LER=18 | Save data in error after learning | ▲Contact with our company |
| LER=19 | Upon top limit, two landing signals input together, top limit switch too low | Move up the top limit switch |
| LER=20 | Bottom limit switch too high | Move down the bottom limit switch |
| LER=21 | Bottom terminal or bottom terminal 2 still valid when learning to the top limit | Check the installation of the bottom terminal or the bottom terminal 2 or check the type of switches |
| LER=22 | Top terminal or top terminal 2 valid when learning from bottom limit | Check the installation of the top terminal or the top terminal 2 or check the type of switches. |
| LER=23 | No pulse input during learning | 1. Check the connection of the main board pulse input; 2. If it occurs on the top landing during the multi-segment running, it is because speed is not set for the inverter during the creeping segment (when the learning runs to the landing of the top floor, the running speed changes from the inspection speed to the creeping speed). |

▲  **Note: for the elevator above 2.0m/s, the system will additionally provide the top and bottom terminal 2 switches.**

# Appendix 4 Operating Instructions of SJT-YY Elevator Emergency Automatic Leveling Control Device

## 1. Overview

SJT-YY elevator emergency automatic leveling device is applicable to emergency operation when power supply is abnormal. When the elevator stops between floors, by utilizing the internal accumulator, this control device would supply power to run the car to the nearest floor, and then level, open the door and evacuate the trapped passengers.

This control device achieves the power failure emergency automatic leveling by the coordination of the internal control circuit, inverter and microprocessor. Compared with the traditional similar product, this control device makes the maximum utilization of the existing resources of the elevator control system. It has the characteristics of low cost, high reliability, flexible control, etc.

## 2. Scope of application

This device is applicable to variable frequency speed control elevator driven by gearless permanent magnet synchronous motor drive or asynchronous motor.

## 3. Model/specification

Model/specification instruction of the device

SJT-YY ☐ ☐ ☐

A: Power of asynchronous motor ≤ 19 KW or
　　Power of synchronous motor ≤ 12 KW
B: Power of asynchronous motor ≤ 30KW or
　　Power of synchronous motor ≤ 22KW
G: Models with asynchronous motor
T: Models with synchronous motor

Blank: Standard model
　I, II: Improved model
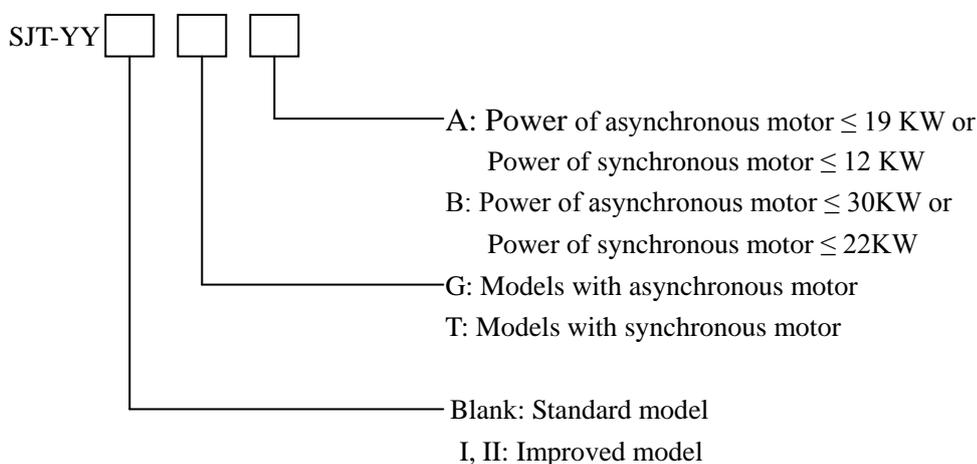
## 4. Working principle and functions

When the device is working, the internal control circuit supplies power and control signal to the inverter and microprocessor. The combined action of the internal control unit, frequency inverter and microprocessor controls the elevator to level at the nearest floor in low speed and open the door. The detailed functions are as follows:

(1) The device and the elevator control system use reliable electric interlock system. When the power supply restores, the elevator will return to the normal running.

(2) Only when all the following conditions have been met, can this device run:
　① Elevator power failure

② Elevator is in the non-inspection state.

③ Elevator is not in landing.

④ The elevator safety circuit signal and door interlock circuit signal are normal.

(3) In the above operating conditions, if only condition ③ is not met and all other conditions meet the requirements, the device will open the elevator door automatically.

(4) When the elevator is provided with weighing device, it can choose the running direction automatically during emergency operation.

(5) Elevator leveling is accurate, the precision is within ±15mm.

(6) The device has maximum operation time protection function (usually 2 min).

(7) The device has automatic constant voltage and constant current charge function.

## 5. Installation and adjustment

Fitting wiring diagram of the device and the SJT-WVF5-A elevator control system produced by our company is as shown in the attached figure. For fitting wiring diagram of the elevator control system produced by other company, this figure can also be used as a reference. Or, our company can provide alternative design for them.

(1) Port function definitions of the device are as follows:

| Symbol | Description | Location | Instruction |
|--------|-------------|----------|-------------|
| PS1 PS2 | Input power | CN1-1 CN1-12 | PS1 and PS2 are the input power. They must be from one of the three phases and the neutral of main power supply. AC220V±15% (50HZ±10%), They provide charge power to the device. And they are used to determine whether the power supply is normal. Wires of 2mm$^2$ are recommended. |
| Y5 | Power failure output signal | CN1-6 | Separate the grounding terminal of brake voltage DC192V supplied by the accumulator from the grounding of brake circuit **(only for synchronization system).** |
| BS+ BS- | Output power | TB1-1 TB1-2 | BS+ and BS-, DC192V, are the output power of the device for power supply to the inverter. 4mm$^2$ wire is recommended. |
| BK+ BK- | Output power (only for models with synchronous motor) | CN1-3 CN1-14 | BK+ and BK- are the brake apply power output provided for the device. DC 192V is for models with synchronous motor. Wire of 0.75mm$^2$ is recommended. |

| | Output brake release signal (only for models with asynchronous motor) | CN1-3 CN1-14 | BK+ and BK- are brake release signals provided by the device. The contactor contact output is used to lock the KMC normally open point in the brake apply circuit. Wire of 0.75mm$^2$ is recommended. |
|---|---|---|---|
| P0 N0 | Output power | P0 (F3-2 below the air switch F3) N0 (small terminal) | The output power supplied by the device is DC500 V, and is used to provide control power for the inverter. P0 is positive and N0 is negative. **(Wiring shall be in accordance with the above when inverter system adopts Yaskawa 676GL5-JJ and Varispeed-L7B.)** |
| CP1 CP2 | Output power | CN1-4 CN1-15 | CP1 and CP2 are the output control power provided for the device. AC220V ±10% (50HZ), maximum power 600W. They are used to supply power to the control circuit and door machine circuit. 0.75mm$^2$ wire is recommended. |
| IL1 IL2 | Power interlock input | CN1-7 CN1-17 | IL1 and IL2 are the interlock input provided by the control system and are contactor contact point input. They are used for the electric interlock of the device and elevator control system. |
| IL3 IL4 | Power interlock output | CN1-5 CN1-16 | IL3 and IL4 are the power interlock output provided by the control system and are contactor contact point output. They are used for the electric interlock of the device and elevator control system. |
| IL5 IL6 | Power interlock output signal | CN1-8 CN1-18 | IL5 and IL6 are the power interlock output provided by the control system and are contactor contact point output. They are used for the electric interlock of the device and elevator control system. |
| Y4 COM4 | Power failure output signal | CN1-19 CN1-9 | Contactor contact point output. They are used to lock the normally open point of the phase-sequence relay in safety circuit when the power fails. |
| Y3 COM3 | Power failure output signal | CN1-20 CN1-10 | Relay contact point output. They are used to provide input signal for the microprocessor. |
| Y2 | Power failure | CN1-21 | They are used to provide input signal |

| Y6 COM2 | output signal | CN1-13 CN1-11 | for the inverter. COM2 is the common terminal. Y2 provides running signal of the frequency inverter accumulator. Y6 provides inverter fault reset signal. **(For individual inverter use)** |
| --- | --- | --- | --- |

(2) Installation, wiring and debugging

① Disconnect the air switch F1, F2, F3, <u>F4</u> **(such a switch is provided when YASKAWA 676GL-JJ and Varispeed-L7B inverter systems are used)** and rocker switch F2 (F1, F2, F3 and <u>F4</u> are device's shutdown switch. They are in disconnecting state when they leave the factory).

② Switch off elevator power supply.

③ Connect the separate terminals of the random cable to the control system according to wire number in compliance with the instruction and requirement of the wiring chart and the above figure. Use the supplied cable to connect the power at the side of inverter with the BS+ and BS- of the device. **When YASKAWA 676GL5-JJ and Varispeed-L7B inverter are used, use supplied cable to connect P0 and N0 of the control cabinet with P0 and N0 of the device.**

④ Strictly check if all the wirings are correct. Incorrect wiring may damage the device or the control system's power-on.

⑤ When all the wirings are checked to be correct, insert the cable plug-in into CN1. Turn off the air switch F1, F3, F4 and rocker switch F2, press power switch of UPS to power the elevator on.

⑥ If the elevator functions normally, set the relevant parameters of inverter.

⑦ Run the elevator to a certain floor, cut off the power. At this moment, the door should open automatically.

⑧ Power on the elevator again. Park the elevator between floors and cut off the electricity again. When emergency operating conditions are met, the elevator should run towards the light load direction, level and open the door.

# 6. Fault analysis and troubleshooting

1. The elevator power is abnormal after the device is connected. Check the interlock wiring.

2. When the power is cut off, there is no display on inverter. Check whether air switch F3 and F4 are shut. Check whether the output power BS+ and BS- are greater than DC192V, whether air switch F1 is shut, and whether battery wiring is secured and reliable.

3. When the power is cut off, the device is connected and the elevator is powered on, the frequency converter has no display. Check if air switch F1 is shut.

4. When the power is cut off, the microprocessor has no display. Check if rocker switch F2 is closed and if the UPS power switch is shut (it should always in the ON state).

5. In emergency operation, the brake of the elevator isn't on. For synchronous motor, check if the brake power output is DC192V. For asynchronous motor model, check if the brake output signal is normal.

6. When power fails, emergency operation does not work. Check if the emergency stop and gate lock circuits are normal, if the elevator is in the non-inspection state, if the normally open point of phase-sequence relay is normal and if the input signals of microprocessor and frequency converted are normal.

# 7. Technical parameters

1. Input power    AC220V±15％  50HZ ±10%

2. Output power   DC192V

AC220V    50HZ      $I_{ed} \leq 3A$

DC110V (for asynchronous motor model) $I_{ed} \leq 3A$

3．Ambient temperature: 0℃ - 40℃

4．Relative humidity: 20 - 90％  non condensing

5．Leveling precision: $\pm$ 15 mm

6．Applicable motor power: Model A    asynchronous motor ≤19KW    synchronous motor ≤12KW

                                Model B    asynchronous motor ≤30KW    synchronous motor ≤22KW

7. Maximum run time ≤ 2min

8. Cabinet dimension:

  YB: 840*240*450

  YC: 574*180*721

# 8. Service and maintenance

1．Accumulator should be used in clean, dry and well-ventilated environment. Short circuit is strictly forbidden. Contact with organic solution and open fire is prohibited. During transportation of the device, keep top side up and avoid collision and violent vibration. Grounding of the accumulator terminal should be kept in good condition.

2．Periodical (e.g. a quarter) check on the accumulator's voltage (those of F1-1 and BS- should be greater than DC192V) and one trial run are recommended.

3．When the accumulator in emergency system reaches the end of service life (when it reaches 50% of the early stage discharge time), the service time shortens significantly, and it would result in the accumulator faults such as the internal short circuit, electrolyte drying up (internal resistance increase) or the corrosion of positive grid. If the accumulator is still in use in this state, the maximum charge current will continue to flow. Heat losses and leakage might happen in the accumulator. Replace the accumulator before it reaches the above state.

| Accumulator surface temperature | Recommended replacement time |
|---|---|
| Below 25 ℃ | Within 6 years |
| 30 ℃ | Within 4 years |
| 40 ℃ | Within 2 years |

# Appendix 5 Advance Door Opening/Re-Leveling Instructions (Above 700-39)

## 1. Safety circuit board (SJT-ZPC-V2) schematic diagram

SJT-ZPC-V2

JP1-1
JP1-2
JP1-3
JP1-4
JP1-5
JP1-6
JP1-7
JP1-8
JP1-9
JP1-10
JP1-11

K10 K11 K14 A1 K12 A2 D5
12 11 21 22 21 22 D1
K12 K11 R1 C1
64 61 11 12
K10
21 22

44 K12 41 A1 K10 A2
44 K10 41 D2

31 K12 32 A1 K11 A2
31 K11 32 D3

A1 K14 A2
D2

K12 K14 K10 K11
21 22 34 33 31 32 41 44

K10 K11
54 51 61 64

K12 K14 K10 K11
11 12 44 43 61 64 51 54

Title

Size B
Number
Revision
Date: 1-Sep-2005    Sheet of
File: F:\再平层安全电路板\SJT-ZP~1.DDB  Drawn By:

## 2. Safety circuit board interface definitions

| Name | Location | Definition |
|------|----------|------------|
| **JP1** | JP1-1 | 24V+ |
| | JP1-2 | 0V |
| | JP1-3 | Re-leveling upper landing |
| | JP1-4 | Re-leveling lower landing |
| | JP1-5 | Control system re-leveling conditions satisfied |
| | JP1-6 | Re-leveling condition satisfied output |
| | JP1-7 | Re-leveling condition satisfied output common port |
| | JP1-8 | Re-leveling landing output |
| | JP1-9 | Re-leveling landing output common port |
| | JP1-10 | Door lock output + |
| | JP1-11 | Door lock output - |

# 3. Wiring diagram for advance door opening/re-leveling function
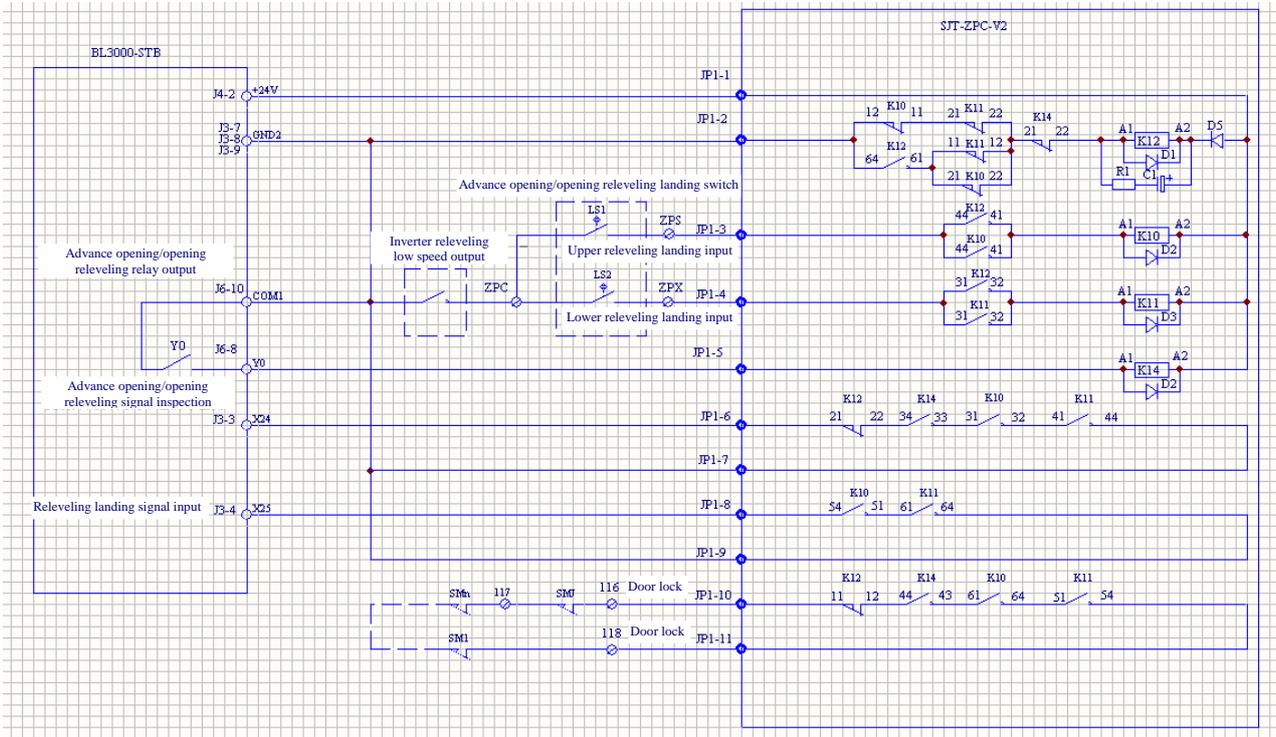


# 4. Installation instructions of re-leveling landing sensor and landing sensor

Two landing sensors shall be installed when advance door opening /re-leveling function is used - mq1: upper landing; mq2: lower landing; sll: upper re-leveling landing; sl2: lower re-leveling landing. Landings should be installed in order, or, the running direction of the re-leveling will be in reverse direction.
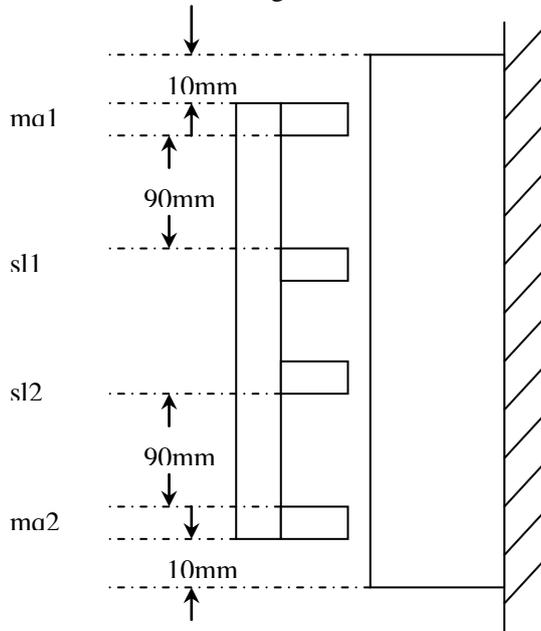


**Note: If electromagnetic sensors are used for sensor S1 and S2, the distance between S1 and S2 must kept at least 5 cm. Otherwise, the two sensors will detect each other and cannot function normally.**

# 5. Mainboard parameter setting

## 5.1 Advance door opening/ re-leveling function enable by special function selection setting in special parameters

**Special function selection setting**

| Function No. | Function Description |
|---|---|
| **FU00~FU18** | For the definition, see system instruction manual. |
| ***FU19** | ON: door opening re-levelling enable; OFF: no re-levelling function. |
| ***FU20** | ON: advance door opening enable; OFF: no advance door opening function. |

## 5.2 Advance door opening/re-leveling function running parameter in running parameters

Three advance door opening and re-leveling related parameters are added in running parameters:

| **Open door speed** **0.15m/s** | **Relevelst speed** **0.20m/s** | **Relevelrun speed** **0.06m/s** |
|---|---|---|
| Open door speed | Leveling stop speed | Leveling running speed |

Open door speed: Elevator advance door opening speed when the elevator switches speed to go into the re-leveling landing.

NOTE: When running in multi speeds (use double door zero speed FU02=ON), the creep speed after speed switch must be less than this speed.

Leveling stop speed: If the speed in advance door opening or re-leveling process is more than this speed, the elevator stops running.

Leveling running speed: The set re-leveling running speed, when the analog is given.

## 5.3 Advance door opening/re-leveling function speed table in multi-speed running

NOTE: When running in multi speeds, double door zero speed FU02=ON must be used to reduce the creeping speed after speed switch.

**Multi speed command output logic**

| Port \ Item | Y15 (J7-6) | Y14 (J7-5) | Y13 (J7-4) |
|---|---|---|---|
| Inspection running speed/self learning speed | 0 | 1 | 0 |
| Re-leveling running speed | 0 | 0 | 1 |
| Creep speed | 0 | 1 | 1 |
| Low speed (V1) | 1 | 0 | 0 |
| Medium speed1 (V2) | 1 | 0 | 1 |
| Medium speed2 (V3) | 1 | 1 | 0 |
| High speed (V4) | 1 | 1 | 1 |

# Appendix 6    BL3000 Digital Block Display and Hoistway Self-learning Operation Instructions
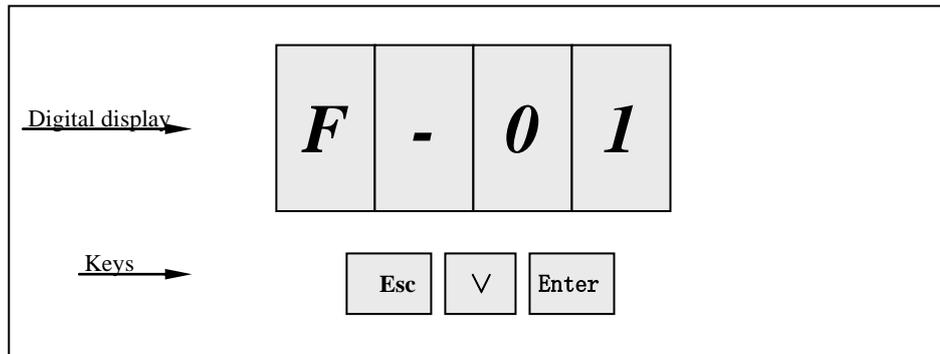


**Fig. Arrangement of Display and Keys**

**ESC: Key for cancellation and return;**

**▽: Page turning key;**

**ENTER: Confirmation key;**

1.    **In normal conditions, display the current floor F-XX:**
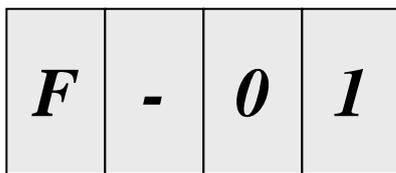


2.    **Blink and display current fault No., if a fault occurs:**
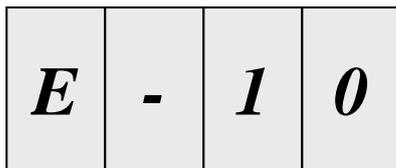


3.    **After press the key ENTER, using page turning key can select parameters from H-00 to H-04:**
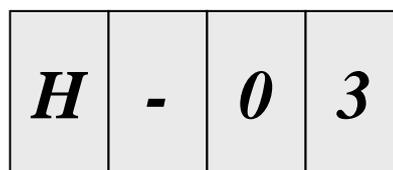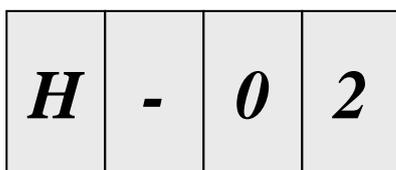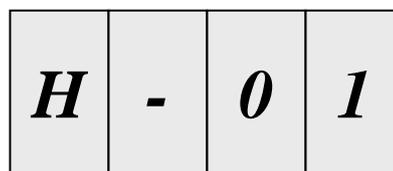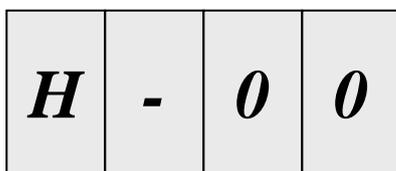
**4. H-00: Invalid parameter;**

**5. H-01: Display current travel speed (cm/s)**

| H | - | 0 | 1 |

ENTER ⟹

| | 1 | 6 | 0 |
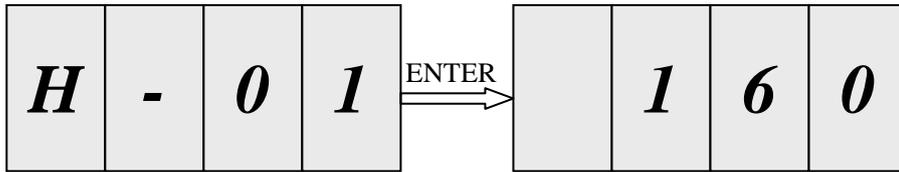
**6. H-02: Hoistway self-learning:**

| H | - | 0 | 2 |

ENTER ↓

| L | 1 | | |
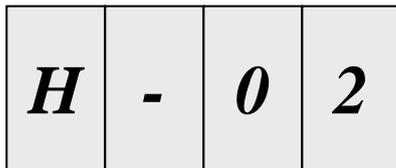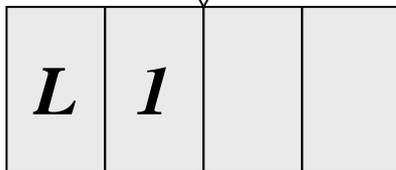
**The elevator is moved to the lower limit position, and display L2.**

| L | 2 | | |
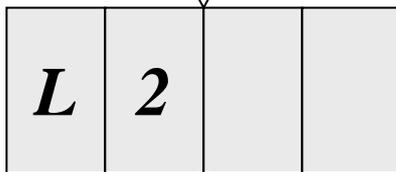
**Press ENTER, the elevator automatically performs hoistway self-learning.**

**Display current floor** ↓

| L | | X | X | ⟹ | L | E | X | X |
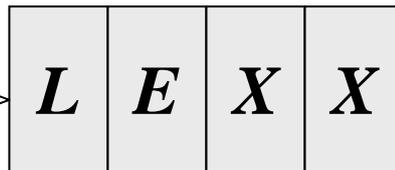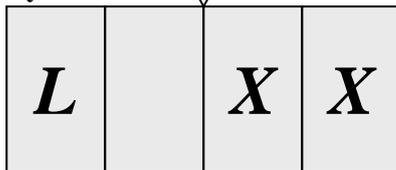
**Display the fault No. of the failed self-learning;**

**press ENTER to exit self-learning**

**Self-learning successfully restored; display L2**   **See Appendix 3 Hoistway Self-learning Fault Codes**

| L | 2 | | |
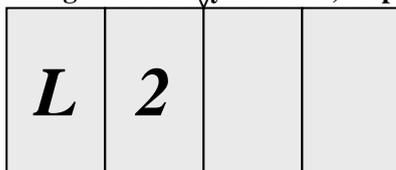
**Press ENTER to exit.**

**7. H-03: Reserve parameters**

| *H* | *-* | *0* | *3* | ENTER ⇒ | | | | *0/1* |
|-----|-----|-----|-----|---------|---|---|---|-------|
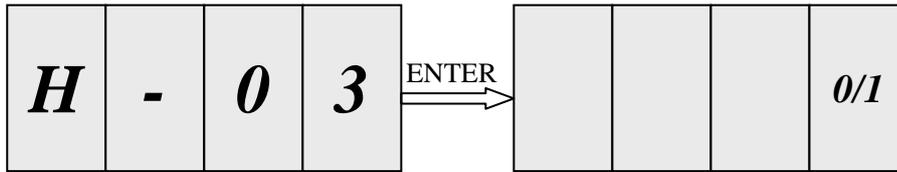
**8. H-04: View 20 fault records,**

| *H* | *-* | *0* | *4* |
|-----|-----|-----|-----|

ENTER ⇓

| *E* | *-* | *0* | *1* | ENTER ⇔ | | | *1* | *0* |
|-----|-----|-----|-----|---------|---|---|-----|-----|

**Fault serial No.**　　　　　　　　　**Fault No. (See Appendix 3: System Fault Code List)**

| *E* | *-* | *0* | *2* | ENTER ⇔ | | | *0* | *9* |
|-----|-----|-----|-----|---------|---|---|-----|-----|
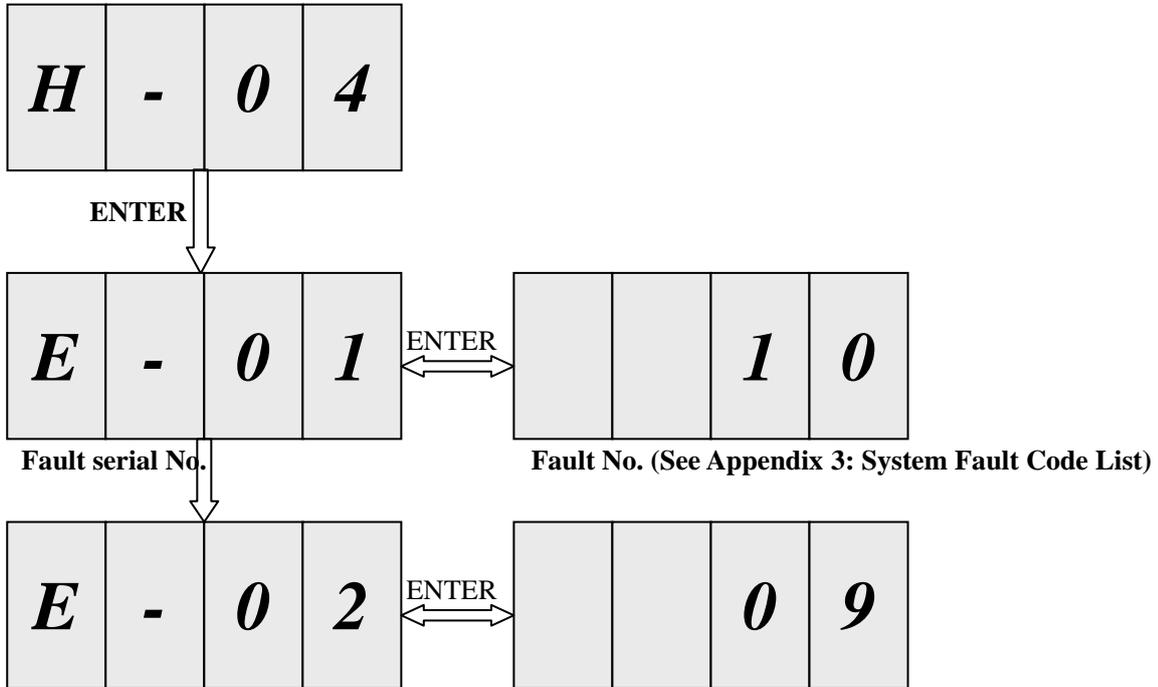
Due to the ongoing product improvement, data is subject to changes without prior notice.