SJT-WVF V-K Control System For Elevator

Technical Manual

（**For BL2000-BKT-V3/FR2000-BKT-V1 Board**）

Elevator Control System User Guide

CONTENT

Introduction

SJT-WVF VI elevator control system is hi-tech smart production, which function is more powerful and debug and maintenance is more convenient. Besides elevator general function, it has the function of parameter set, function select, debug and maintenance and locale adaptation.

System's general control mode is parallel communication and frequency conversion timing. It adapts that total floors are smaller than 12 and elevator speed is smaller than 1.75m/s. It may be equipped with all kind of elevator motors include permanent magnet synchronous motor.

BL2000-BKT elevator controller (main board, COP and landing call board) MCU is 32 bits FUSITSU microprocessor, which integrate degree and reliability are first-class in the world. FUJITSU is a famous industrial MCU manufacturer. It is Software technology characteristic that function is perfect, setting parameter interface is clearly arranged, debugging and diagnostic information is sufficient, resistor interference is powerful and intensity of interference evaluates. We design diagnostic interface for electric components except elevator control system. Elevator diagnose has a definite object in view. It realizes high performance and reliability united, high level and practicability united and hi-tech and simple usage united.

Warning:

When user makes use of SJT-WVF V system, you should strictly accord to national elevator standard and read used transducer manual in detail. All of parts related to safety are warning to user.

CAUTION

Symbol and diagram refers to drawing attached machine, which may be changed in this manual.

Chapter 1 Control System Function

1.1 general function

1.1.1inspection running

There are 3 inspection switches, which are car top inspection switch, car inspection switch and control cabinet inspection switch. Their priority deceases one by one. If the high priority switch is valid, the low priority switch will be invalid. When push down up-run/down-run button in inspection state, elevator runs up/down at inspection speed, it will stop, if you release button. System close/open door is push-start and release-stop mode in inspection state.

1.1.2 automation running (no attendant)

When control cabinet switch is on 'normal position', COP switch is on 'automation' position and the other inspection switch is invalid, elevator runs in automation state. Landing call register rule is that elevator services the same direction call and elevator services the opposite direction call at the highest (lowest) floor. After leveling it automatically open door, then it will close door in delay time, which can be set in menu. If close door button is push down, door will be closed ahead of delay time. If there is landing call on current floor, door is opened automatically. When all of register calls are serviced, elevator returns to homing floor.

1.1.3 attendant running

When control cabinet switch is on 'normal' position, COP switch is on 'attendant' position and the other inspection switch is invalid, elevator runs in attendant state. In attendant state, car call is register. If there is landing call, corresponding car call light in car box will twinkle. Elevator services the same direction call. After leveling it automatically open door, but it don't close door until close door button be push down.

1.1.4 automatically open door after power on

If car box at leveling zone when elevator is powered on, door is opened automatically.

1.1.5 automatically close door time set

In automation state, elevator automatically opens door and close door in delay time when it stops. Delay time is set by open door holding time. When elevator stops for car call, delay time is T (set time); When elevator stops for landing call, delay time is T-2s; when elevator stops for both car call and landing call, delay time is 2T.

1.1.6 open door for current floor landing call

If you push down landing call button at current floor when door is closing or closed but elevator doesn't start, door will be opened automatically. Delay time is set by open door holding time.

1.1.7 safe board or photoelectric board protection

If safe board or photoelectric board acts when door is closing, closing action stops at once, door is opened and closed again. if safe board or photoelectric board action isn't cleared up, door isn't closed.

1.1.8 full load lay a course and over load don't close door

If there is load device, elevator responds to car call and not to landing call when it is full load. If elevator is over load, door is opened, overload light is turned on, buzzer sounds, 'CZ' is displayed on COP and close door button is valid. It restores normally after overload is clear up.

1.1.9 laying a course in attendant control.

In attendant state, elevator responds to car call and not to landing call if pass over button is pushed down.

1.1.10 running state display

Elevator state, direction, floor, door state, load and fault information may be displayed on LCD

1.1.11 automation control light

Car box light is turned off if elevator isn't used in 15 minutes. It will be turned on after receive any call.

1.1.12 fire

When fire switch is closed, system enters into fire state. It clears up all calls and return to fire floor open door. If elevator direction is opposite, it stops at nearest floor without open door and returns to fire floor open door. When it arrives at fire floor, it output fire signal.

There are two kinds of fire mode for user to choose:

a. mode 1: elevator returns to fire floor and stops service.

b. Mode 2:

  (a) landing call is invalid.

  (b) Door is opened at fire floor. 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 closed, door is opened at once.

  (c) When elevator arrives at destination floor, door is closed. Fireman presses open door button until door opened. If open door button is released before door open, door is closed at once.

  (d) One destination floor is set every running.

1.1.13 automatically stop for fault

When elevator doesn't stop at leveling zone for fault, it should be automatically crawling to leveling zone and open door if safe circuit and transducer are both normal

1.1.14 parking

When electronic lock is closed in automation state, elevator enters into parking state. Elevator doesn't respond to landing call. If there is car call, it finishes all car call service and returns to parking floor (set). Otherwise, it returns to parking floor directly. After it arrives at parking floor, it doesn't respond to landing call and landing call box and COP display 'ZT'. Door is automatically closed, light is turned off and display is cleared in 10 seconds. If anybody is in car box, he press car call button or close/open door button, light is turned on. He can leave car box by push down close/open door button. Door is automatically closed and light is turned off again in 10s.

When electronic lock is closed in inspection state, elevator can't return to parking floor, the other is the same as above.

CPU always works in parking state, elevator exits parking state and normally runs as soon as electronic lock is opened.

1.1.15 twins control

When parallel connection of two elevators is connected by attached cables and set parameters, parallel running is realized. It's character: 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. Elevator efficiency is improved. When two elevators both haven't service, one returns to homing floor, another stays at there.

1.1.16 group control

BL-2000 may controls 8 elevators in the group control mode.

1.2 special function

1.2.1 hoistway learning

System can get and save the position of leveling zone and hoistway switch by hoistway learning.

1.2.2 cancel mistake operating

When passenger mistake pushing down car call button and this call is registered (light on), it can be canceled by push the button again if elevator doesn't start.

1.2.3 prevent making trouble

When elevator arrives at farthest floor and changes direction, it clears all car call registers. If it has load device, when it is light load, the number of car call is 3 at most.

1.2.4 landing call button inset diagnose

When landing call button is press for 20s, this call is invalid. The corresponding light twinkles to alarm. When the button is released, system restore normally.

1.2.5 repeat close door

After perform close door command, 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.

1.2.6 close/open door and call at machine room

You can input close/open door and car call command by LCD operation.

1.2.7 don't stop floor set

User may set any floor not to stop.

1.2.8 homing floor set

In automation state, if there are car call and landing call in some time, elevator returns to homing floor (only one).

1.2.9 displaying character set

Displaying character may set by LCD operation, which is letter or figure.

1.2.10 attendant select direction

In attendant state, attendant has priority to choose running direction by up-run/down-run button.

1.2.11 automatically start/stop service

User may set start/stop service time by practical requirement. Time is set by 24 hours

If the time of start service equates to stop service, this function is canceled.

This function is valid in electronic lock is switched on, if it is switched off, elevator works at parking state.

If you want elevator exit from automatically stop service, you may perform the following operation: you switch electronic lock from on to off for 1s, then you switch it on again, elevator will normally run When elevator finishes using. If you want elevator exit normal running, you switch electronic lock from on to off for 1s, then you switch it on again, elevator will enter into automatically start/stop service state.

1.2.12 special running

If elevator has special button, it may run in special state. Landing call is invalid. Elevator is controlled by attendant. Door control mode is the same as attendant mode.

1.2.13 Automatically close door delay time (open door delay time) set

Elevator has a close door delay button. In automation state, when this button is pushed down, open door holding time is open door delay time. This function is used in hospital elevator.

1.2.14 two doors control

It can control two doors act at corresponding floor. Refer to chapter 3.

1.2.15 fault diagnose

When elevator is error, WVF-V system diagnose fault and display fault information on LCD. The time, type and floor of the latest 10 faults is stored, maintenance can check them. Refer to appendix 7.

1.2.16 interference evaluation

EMI is potential threaten to MCU control elevator. Contactor action and PWM generate interference to MCU unit and communication wire, even it makes system power off or mistake acting. WVF-V system not only takes measure to improve is resistor interference, but also evaluates system connection with ground. It conducts maintenance to remove hidden trouble and provides more safe and reliable circumstance. This function is used after finishing debugging.

1.2.17 coder evaluation

Coder is a component detecting elevator speed and position, which performance and installation is key to elevator running. Many faults is generated from it. WVF-V evaluates coder pulse and conducts maintenance to get rid of trouble of tingling and leveling.

1.2.18 input port evaluation

Because traveling cable, hoistway cable and MCU unit is parallel connected, the interference can't be neglected, which may lead to display error and leveling fault. WVF-V evaluates input signal and display on LCD. It conducts maintenance lay out cables and solves above problem completely.

1.3 safety protection

1.3.1 safe circuit protection

If safe circuit is opened, elevator stops at once.

1.3.2 door inter-lock protection

Only all door inter-lock is closed, elevator runs. If door inter-lock is opened or tingled, elevator will stop.

1.3.3 auxiliary contactor protection

System may check main circuit contactor action, if there is abnormal (e.g. conglutination), elevator will stop.

1.3.4 braking detect protection

System detects brake action by braking arm switch, if brake action is error, system forbid elevator starts.

1.3.5 terminal change direction and leveling revise

When system detects terminal switch, elevator is forced to change direction and revise display.

1.3.6 limit protection

When system detects limit switch, elevator stops at once.

1.3.7 utmost protection

When system detects utmost switch, system is powered off.

1.4 select function

1.4.1 Remote monitor

You may monitor elevator running in monitor center by wire or wireless module.

1.4.2 traction motor select

System may be equipped with asynchronous/synchronous motor or gear/gearless motor.

Chapter 2 Control System Composing And Installation

2.1 control system composing

2.1.1 system structure and schematic diagram

Figure 2-1 is system structure. Main board BL-2000-BXB is main control unit. It exchanges datum with COP and landing call box by CAN BUS. It collects datum from hoistway and safe circuit by parallel. MCU analyzes these data, then it outputs control and answering signal to control transducer, door machine and braking device. It realizes logic function, fault diagnose and direct stop function etc.
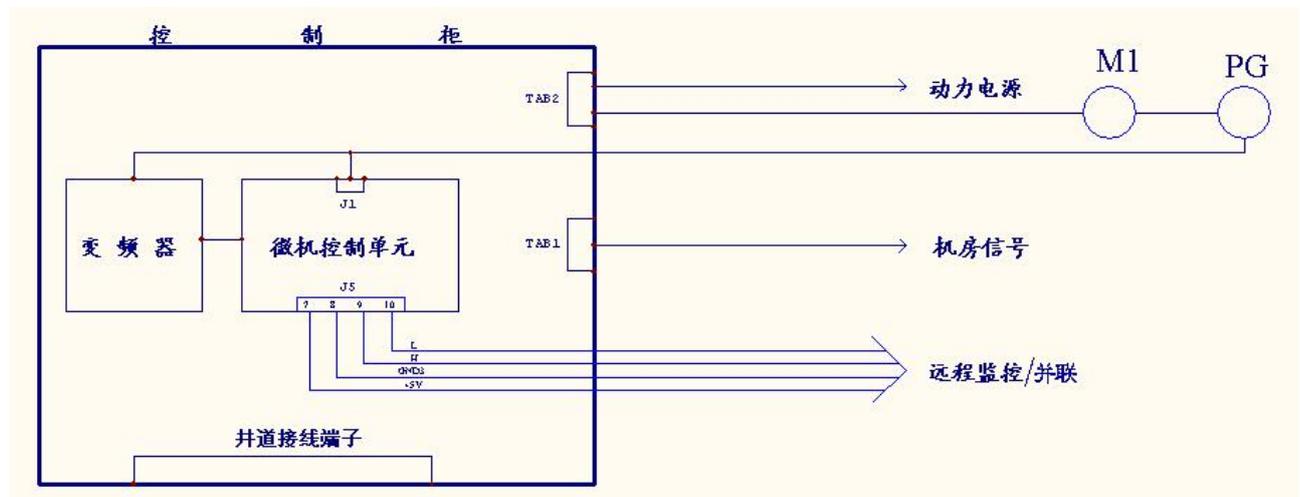
2-1 system structure

●**2.1.2 control system combination**

Figure 2-2 is components and parts of an apparatus lay out. The position may be modified, it is only for refer to

2 – 2
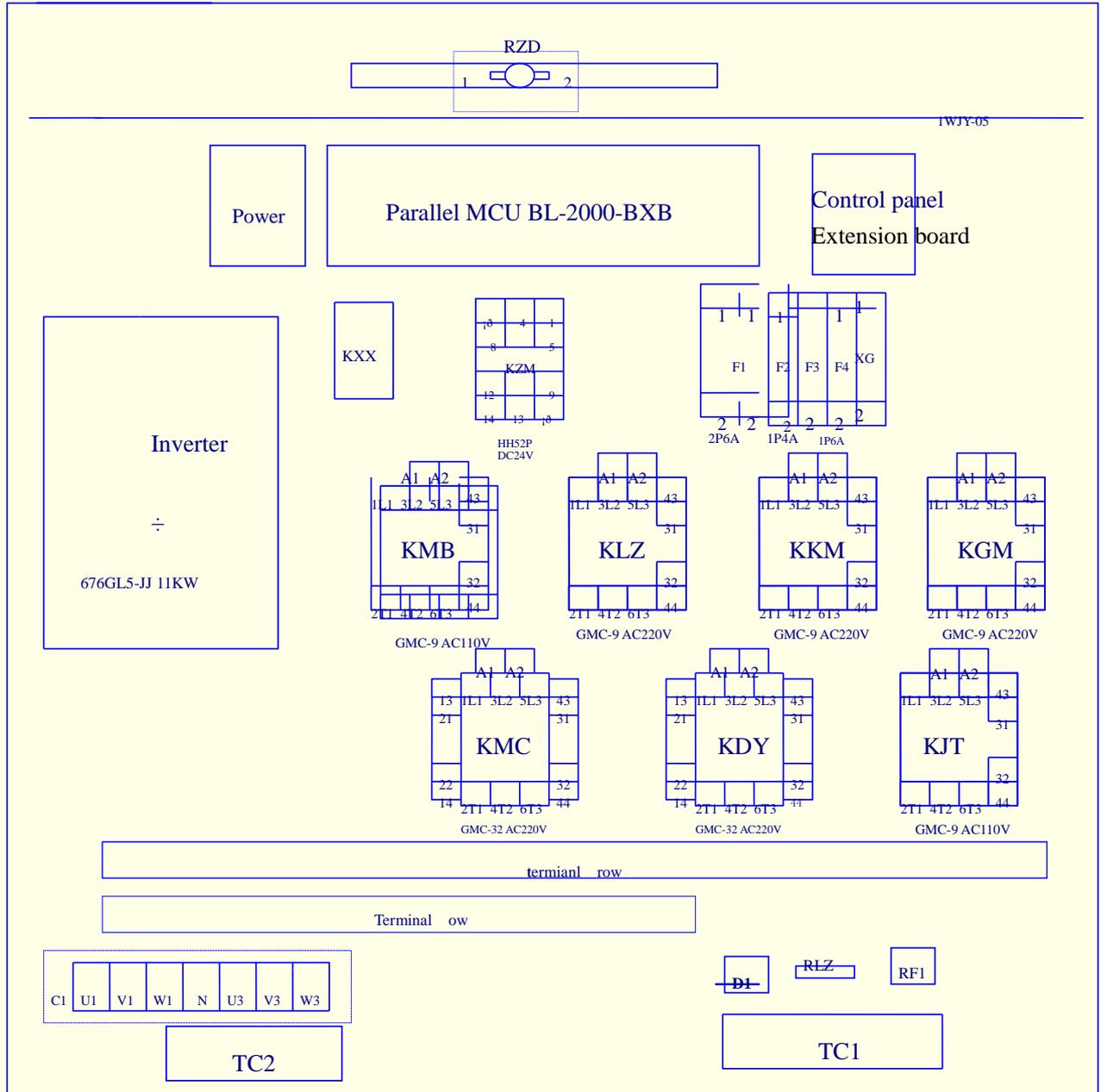
2.1.2.1 MCU 2000-BKT

2.1.2.2 Main board is the control system kernel, all of control instruction is sent by it. Refer to 2-3.

:
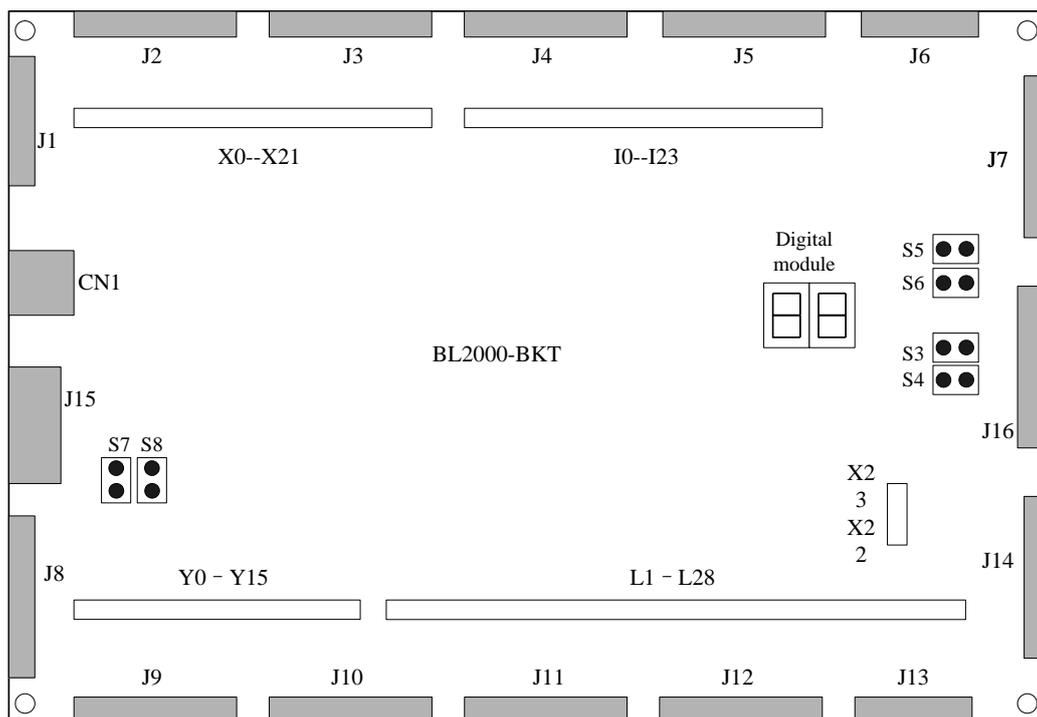
2.3

J16 is port for extension, CN1is port for BX-100 hand LCD operato, J15 is port for programme or PDA hand operator.

S5、S6：If J16 is connected with first extension of BL2000-EBA or BL2000-EBB, please arrange S5&S6 as jumper wire short connection（S3、S4 disconnection）;

S3、S4：If J16 is connected with simulation extension of BL2000-MNB, please arrange S3 & S4 as jumper wire short connection（S5、S6 disconnection）。

- ➤ X0~X21 LED：corresponding indicator for input of X0~X21（control panel, shaft）;
  I1~I28 LED：corresponding indicator for input of I1~I28（car,calling）.
  - input port
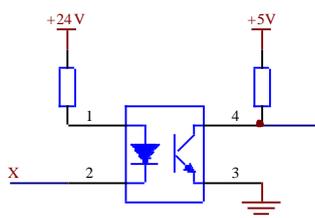
- ➤ X22~X23LED：corresponding indicator for two group individual input of X22、X23、X24、X25（for110V/AC）;
  - input port
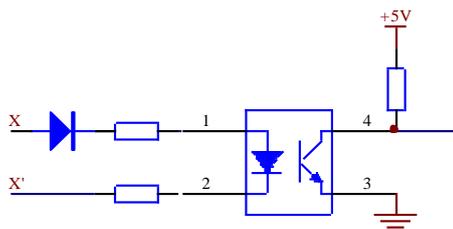
- ➤ L1~L30 LED：corresponding indicator for output of L1~L30 LED （car,calling）;
  Y0~Y15 LED：corresponding indicator for output of Y0~Y15（control panel, shaft）;

➢ Number tube：when normal running, display floor numbers, when under inspection, display "J" and if in malfunction, the twinkling number is the fault code.

Details as below：

J1 is port for MCU encoder input., please refer to below sheet;

2-1

terminal	location	definition
+15VB	J1-1	15V input
A+	J1-2	A+ phase impulse
B+	J1-3	B+ phase impulse
A-	J1-4	A- phase impulse
B-	J1-5	B- phase impulse

J2 ，J3 port for MCU input of X0-X19, please refer to below sheets:

2-2　　J2

Terminal	Location	Definition
X0	J2-1	Inspection input
X1	J2-2	Up running input
X2	J2-3	Down running input
X3	J2-4	Top terminal2/ door open limit 2 input ▲
X4	J2-5	Bottom terminal 2/ door close limt 2 input▲
X5	J2-6	Top limit input
X6	J2-7	Bottom limit input
X7	J2-8	Top terminal 1input
X8	J2-9	Bottom terminal 1 input
X9	J2-10	Up leveling input

J3

terminal	location	definition
X10	J3-1	Down leveling input
X11	J3-2	Inverter fault input
X12	J3-3	Fire fighting input
X13	J3-4	Emergency stop 1 input
X14	J3-5	Door interlock 1 input
X15	J3-6	Main power contactor input
X16	J3-7	Assistant contactor input
X17	J3-8	Brake feedback input
X18	J3-9	standby/safety edge 2 input ▲
X19	J3-10	Inverter running input

J4 . J5 ports for MCU input of X20,X21 and I1-I17, refer to below sheets:

2-3　　J4

terminal	location	definition
X20	J4-1	Electrical lock input
X21	J4-2	Standby input
GND2	J4-3	24Vgrounding (inputCOM)
I1	J4-4	Door open limit 1 input
I2	J4-5	Door close limit 1input
I3	J4-6	Safety edge 1input
I4	J4-7	Overload input
I5	J4-8	Full load input
I6	J4-9	Light load input
I7	J4-10	No load / door open 2 input▲

J5

terminal	location	Definition
I8	J5-1	automatic/attendant input
I9	J5-2	Privilege input
I10	J5-3	Lay a course input
I11	J5-4	Door open 1 input
I12	J5-5	Door close 1 input/ door close 2 input▲
I13	J5-6	Door open delay input
I14	J5-7	Inner calling 1 input
I15	J5-8	Inner calling 2 input
I16	J5-9	Inner calling 3 input
I17	J5-10	Inner calling 4 input

▲　　means shifting of input function (default input function/going through door input), pleaser refer to part of 3.4.4 special parameter menu and operation　　(13)　of special function choice。

J6　port for MCU input of I18-I27, refer to below sheet:

2-4

Terminal	Location	Definition		Terminal	Location	Definition
I18	J6-1	Up calling 1input		I21	J6-4	Down calling 2 input
I19	J6-2	Up calling 2 input		I22	J6-5	Down calling 3 input
I20	J6-3	Up calling 3 iinput				

J7　por for MCU input of I23,24V,5V power and bus, refer to below sheet:

2-5

Terminal	Location	Definition		Terminal	Location	Definition
I23	J7-1	Down calling 4 input		GND3	J7-6	Power grounding
GND2	J7-2	24Vgrounding		+5VIN	J7-7	5V power
+24V1	J7-3	24V (input) power		GND3	J7-8	Power grounding
+24V2	J7-4	24V output		0H	J7-9	CAN-H（for paralle connection）
+24V2IN	J7-5	24Vpower		0L	J7-10	CAN-L（for parallel connection）

J8．J9 port for MCU output of Y0-Y13, refer to below sheet:

2-6　J8　　　　　　　　　　　　　　　　　　　　　　　J9

Terminal	Location	Definition		Terminal	Location	Definition
Y0	J8-1	Acceleration/deceleration time shifting output		Y6	J9-1	Brake output
COM1	J8-2	Y0 common port		Y7	J9-2	Economical resistance output
Y1	J8-3	Fire fighting linkage output		Y8	J9-3	Main contactor output
COM2	J8-4	Y1 common port		Y9	J9-4	Assistant contactor output
Y2	J8-5	Door open 2 contactor output		COM5	J9-5	Y6~Y9 common port
Y3	J8-6	Door close 2 contactor output		Y10	J9-6	Inverter up direction output
COM3	J8-7	Y2~Y3 common port		Y11	J9-7	Inverter down direction output
Y4	J8-8	Door open 1 contactor output		COM6	J9-8	Y10~Y11 common port
Y5	J8-9	Door close 1contactor output		Y12	J9-9	Inverter making able output
COM4	J8-10	Y4~Y5 common port		Y13	J9-10	Multi speed instruction 1 output

J10．J11 port for MCU output of Y14,Y15 and displaying output of L1-L15, refer to below sheets:

2-7　J10　　　　　　　　　　　　　　　　　　　　　　J11

Terminal	location	Definition		Terminal	Location	Definition
Y14	J10-1	Multi speed instruction 2 output		L8	J11-1	high seven segment bc displaying output
Y15	J10-2	Multi speed instruction 3 output		L9	J11-2	high seven segment g displaying output
COM7	J10-3	Y12~Y15 common port		L10	J11-3	Up arrow displaying output
L1	J10-4	Low seven segment a displaying output		L11	J11-4	Down arrow displaying output

L2	J10-5	Low seven segment b displaying output		GNDS	J11-5	L1~L11 common port
L3	J10-6	Low seven segment c displaying output		L12	J11-6	Arriving gong output
L4	J10-7	Low seven segment d displaying output		COM8	J11-7	L12 common port
L5	J10-8	Low seven segment e displaying output		L13	J11-8	Buzzer output
L6	J10-9	Low seven segment f displaying output		L14	J11-9	Light shutting off relay output
L7	J10-10	Low seven segment g displaying output		L15	J11-10	Overload responding output

J12 port for MCU displaying output of L16-L20, refer to below sheet:

2-8

Terminal	Location	Definition		Terminal	location	Definition
L16	J12-1	Door open delay corresponding output		L21	J12-6	Inner calling 3 corresponding output
L17	J12-2	Door open 1 corresponding output		L22	J12-7	Inner calling 4 corresponding output
L18	J12-3	Door close 1 corresponding output		L23	J12-8	Up calling 1 corresponding output
L19	J12-4	Inner calling 1 corresponding outpurt		L24	J12-9	Up calling 2 corresponding output
L20	J12-5	Inner calling 2 corresponding output		L25	J12-10	Up calling 3 corrresponding output

J13 port for MCU displaying output of L21-L30, refer to below sheet:

2-9

terminal	location	Definition
L26	J13-1	Down calling 2 corresponding output
L27	J13-2	Down calling 3 corresponding output
L28	J13-3	Down calling 4 corresponding output
OGND2	J13-4	L13~L28 common port
OGND2	J13-5	L13~L28 common port

J14 port for MCU input of X22-X25, refer to below sheet:

2-10

terminal	Location	Definition		Terminal	Location	Definition
	J14-1				J14-6	
X22	J14-2	110V emergency stop input +			J14-7	
	J4-3			X24	J14-8	110V door interlock input +
X23	J14-4	110V emergency stop input -			J14-9	
	J14-5			X25	J14-10	110V door interlock input -

MCU can finish 4/4 (floor/stop), going through door (with EBB card)/ full collective/ frequency conversion timing logical

controlling of elevator.

2.1.2.2   Extension unit BL2000-BMN-V0
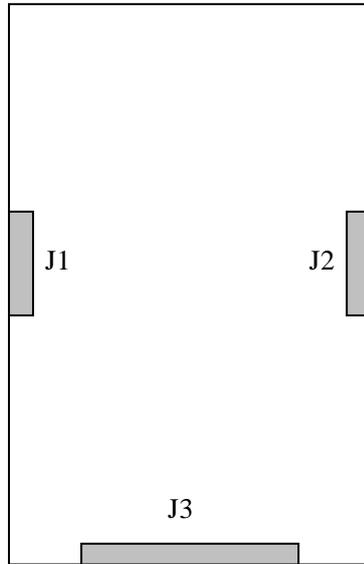
BL2000-BMN-V0

BL2000-BMN-V0 extension unit must be used as the first extension car, floors/stops extension card is connected after it.

Note:main board of FR2000-BXB.V0 version can not use such function （S3、S4 short connection，S5、S6 disconnection ）

J1、J2 are ports for extension.

Definition of J3 as below:

J3-1: simulating given 0~10V；For COM port, please use J7-8 port of FR2000-BXB 0V

2.1.2.3 Extension unit BL2000-EBA
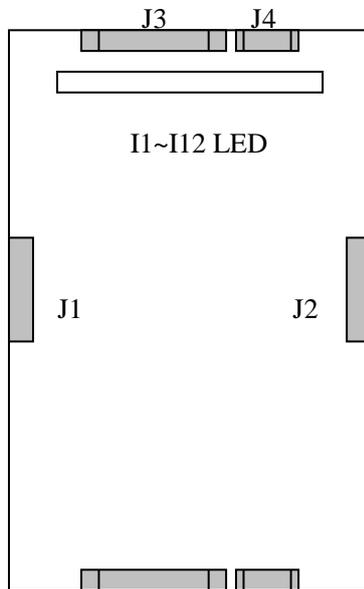
2.4   BL-2000-EBA

J1、J2 are extension port, I1~I12 LED are corresponding indicator for input of I1~I12.

The detailed narrative are as below:

J3   port for extension unit 5-8 floors input of I1-I10, refer to below sheet:

2-11

Terminal	Location	Definition		Terminal	Location	Definition

I1	J3-1	Inner calling 5 input		I6	J3-6	Up calling 5 input
I2	J3-2	Inner calling 6 input		I7	J3-7	Up calling 6 input
I3	J3-3	Inner calling 7 input		I8	J3-8	Up calling 7 input
I4	J3-4	Inner calling 8 input		I9	J3-9	Down calling 5 input
I5	J3-5	Up calling 4 input		I10	J3-10	Down calling 6 input

J4 port for extension unit 5-8 floors input of I11,I12, refer to below sheet:

2-12

Terminal	Location	Definition
I11	J4-1	Down calling 7 input
I12	J4-2	Down calling 8 input
	J4-3	
	J4-4	
	J4-5	

J5 port for extension unit 5~8 floors output of L1~L10, refer to below sheet:

2-13

Terminal	Location	Definition		Terminal	Location	Definition
L1	J5-1	Inner calling 5 corresponding output		L6	J5-6	Up calling 5 corresponding output
L2	J5-2	Inner calling 6 corresponding output		L7	J5-7	Up calling 6 corresponding output
L3	J5-3	Inner calling 7 corresponding output		L8	J5-8	Up calling 7 corresponding output
L4	J5-4	Inner calling 8 corresponding output		L9	J5-9	down calling 5 corresponding output
L5	J5-5	Up calling 4 corresponding output		L10	J5-10	down calling 6 corresponding output

J6 port for extension 5-8 floor output of L11,L12 and common por, refer to below sheet:

2-14

Terminal	Location	Definition
L11	J6-1	Down calling 7 corresponding output
L12	J6-2	Down calling 8 corresponding output
GNDS	J6-3	L1~L12 common port
GNDS	J6-4	L1~L12 common port
GNDS	J6-5	L1~L12 common port

2.1.2.4 extension unit BL2000-EBB
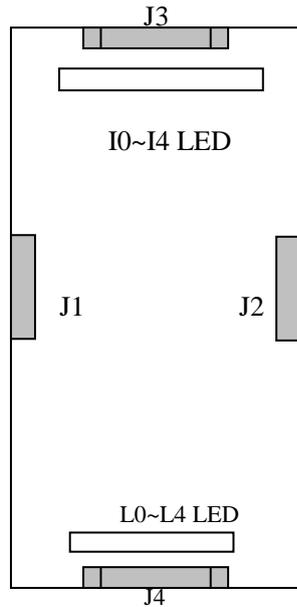
2.5   BL-2000-EBB

BL2000-EBB is extension car for going through door. If setting going through door as 1~4, this card should be used as first extension card. If using simulating given card, please connect this card after simulating card.

J1、J2 are extension ports.

J3 is input port, I0~I4 LED are corresponding radiation indicator for input of I0~I4;

Terminal	Location	Definition
I0	J3-1	Door open 2 input
I1	J3-2	Door close 2 input
I2	J3-3	Door open limit 2 input
I3	J3-4	Door close limit 2 input

Terminal	Location	Definition
I4	J3-5	Safety egde 2 input

J4 is output port，L0~L4 LED are corresponding radiation indicator for output ofLI0~L4。

Terminal	location	Definition
L0	J4-1	Door open 2 corresponding output
L1	J4-2	COM0
L2	J4-3	Door close 2 corresponding output
L3	J4-4	COM1

Terminal	Location	Definition
L4	J4-5	

Code definition as below：

2.1.2.5   Inverter：Driving device for elevator running, controlled by MCU

2.1.2.6   TC1：Transformer for control power., supply power to control panel。 Input voltage of AC380, output voltage of AC220V & AC110V.

2.1.2.7   TC2：Transformer for safety light power of control panel . Input voltage is AC220V,output voltage of AC36V.

2.1.2.8   Switch power：Working power of MCU, its input voltage is AC220V, outputs are DC24V and DC5V.

Note：The switch power must be grounded reliably, otherwise the MCU may work abnormal.

2.1.29   KXX：Phase Sequence relay

2.1.2.10   F1～F4：air switch   F1：main power switch;   F2：110V control power switch; F3：220 V control power switch; F4：
36V light power switch

2.1.2.11   KMC：Main contactor., controlling power of inverter

2.1.2.12   KDY：Assistant contactor, controlling circuit between inverter output and motor

2.1.2.13   KJT：Emgency contactor

2.1.2.14   KMB：Door interlock contactor

2.1.2.15   KLZ：   Brake contactor

2.1.2.16   KJR：   Economical resistance contactor

2.1.2.17   KKM：Door open contactor

2.1.2.18   KGM：Door close contactor

2.1.2.19   RZD：Brake resistance

2.1.2.20   TZD：Temperature sensing switch for monitoring brake resistance temperature

2.1.2.21   RF1：Commutating bridge, output of DC110V

2.1.2.22   D1：Brake continuous current diode

2.1.2.23   RLZ：Brake continuous current resistance

2.1.2.24   RJ：Brake economical resistance

2.1.2.25   C1: Main circuit terminal group

Above terminals, please kindly refer to the electric schematic diagram.

2.2   Control system installation

2.2.1 hoistway and travel cable installation

Please install hoistway cable and travel cable according to the electric schematic diagram

When welding, the zero conductor of electric welding machine must be connected with the welded items reliably. It is probihited to use the grouding of cable as zero conductor of electric welding machine.

2.2.2 control cabinet installation and connection

There are 7 terminals in main circuit connector C1. U1, V1 and W1 are 3-phase power input. Power from distribute room input into U1, V1 and W1 through air switch, N is neuter wire. The section area of wire is determined to load. If load is 15KW motor, the section area is no less than 10mm^2. U3, V3 and W3 are connected with motor coil. If they are mistook connecting, transducer will be damaged. Power cable should be separated from signal cable, if they are putted into the same slot, system may work unreliably. Cable between motor and control cabinet is as short as possible (<5m), the section area should be increased if output power is wasted too much.

Small terminal row has ports for encoder, interphone and standby line connection. The definition of other terminal rows, please refer to electric shecmatic diagram.

2.2.3 Rotary Encoder installation of connector

Encoder is important detection component, which quality directly affect on system performance. Generally it is fixed at factory, if it need to fix at locale, the following is noticed:

(1) Countershaft coder is fixed at motor tail by soft cardo. It is sure of concentric degree. If it is not good, coder steadily outputs pulse, elevator doesn't run in smooth, cardo may be damaged. To avoid slide, the nail is fix at flat besides shaft. If cardo looses, system feedback is error and elevator tingles and don't leveling.

(2) If there isn't axostyle, nesting coder is fixed at motor shaft. The diameter is confirmed before ordering. To avoid damaging glass bar, it is forbid to heavy strike. Coder doesn't tingle when motor runs.

(3) Coder cable is rightly connected with transducer and MCU system. It will be damaged if connection is error. Coder cable is putted into metal tube far from power cable. Notice: coder shield can't be connected with motor ground wire.

2.2.4 leveling zone switch and shelter board fix

Elevator needs 2 door zone switches and some shelter boards to control leveling. 2 leveling zone switches are fixed at car top; shelter boards are fixed in hoistway, which position refers to the following figure2-9:

Leveling zone switch adopt photo electronic switch or magnistor.
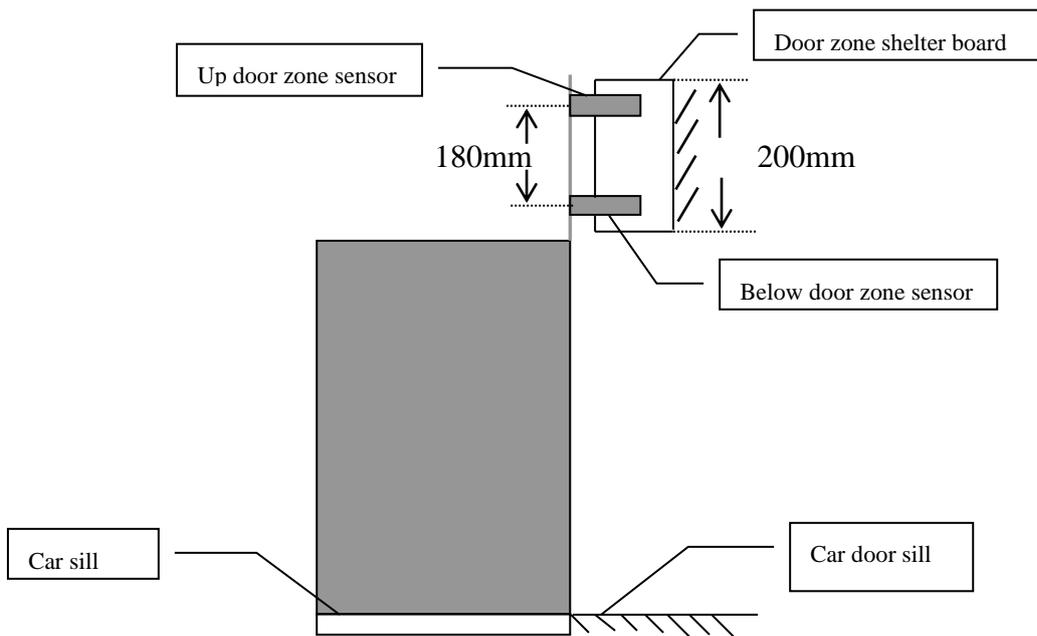
2.2.5 Top/bottom terminal switch fix

Elevator needs one top terminal switch, bottom terminal switch (<1.75) and terminal shelter board. Top/bottom terminal switch are fixed in hoistway. Terminal shelter board is fixed on car top. Top/bottom terminal switch is fix the position which distance is 2.5m (<1.6m/s) from car box sill to top/bottom hall sill.

The detailed installation position, please refer to below table.

2-15   terminal installation position

unit：m

speed	0.5m/s	1.0m/s	1.6m/s

position terminal name			
Top/bottom terminal 1	1m	1.3m	2.6m
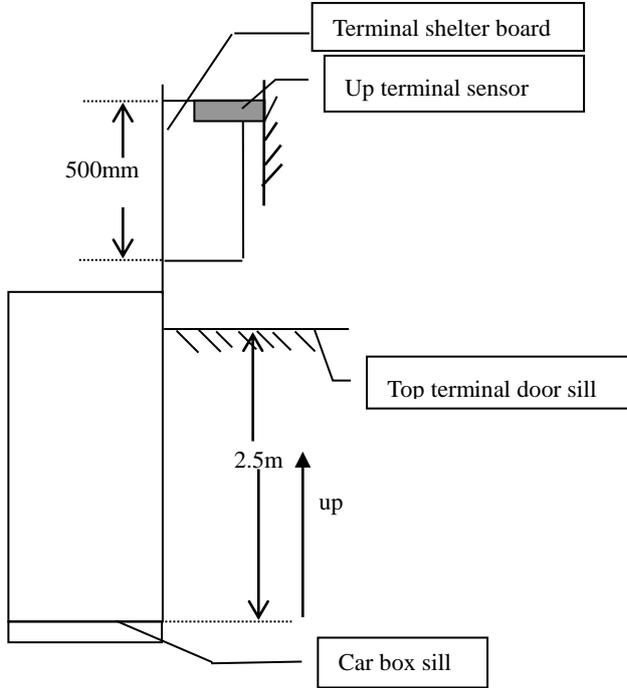
（Top terminal installation figure）
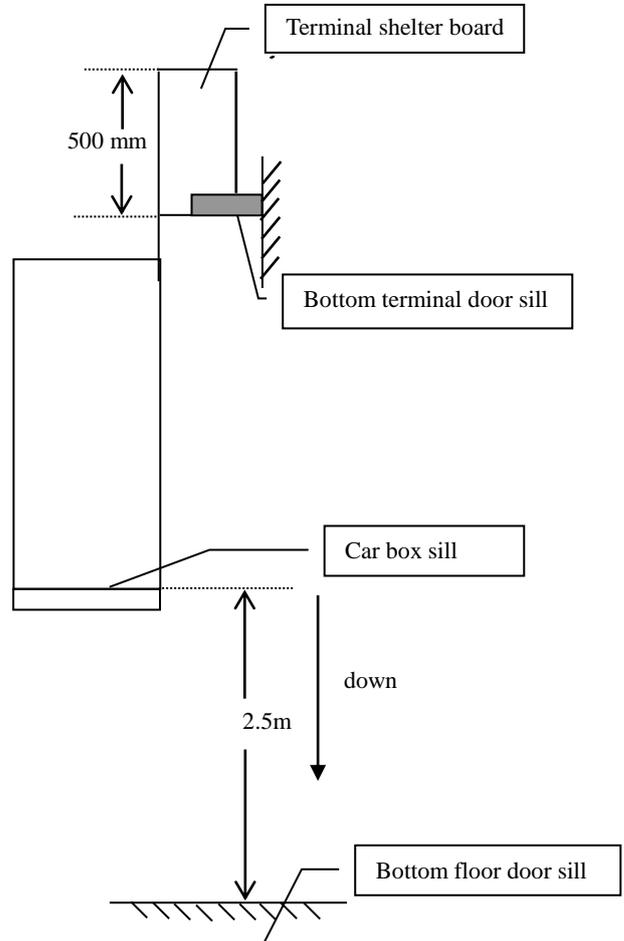
（bottom terminal installation figure）

figure 2-10　top/bottom terminal installation figure（1.6m/s）

Chapter 3 LCD Display And Parameter Operation

3.1 summary

LCD is a good interface for debug and maintenance. They may set and monitor elevator running by LCD.

1. monitor elevator state: automation, inspection, attendant, fire and lock etc.
2. monitor: hoistway position, elevator speed, I/O port, fault information, load, landing call ,car call and communication etc.
3. set parameters: general parameter, running parameter and special parameter
4. hoistway learning
5. save parameter
6. set new password

3.2 key operation

There are 6 keys on it. Which function is defined as follow:
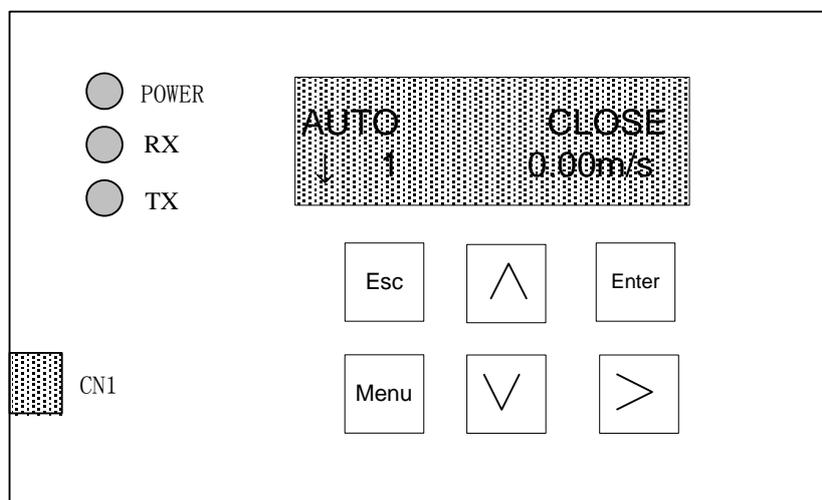
Menu: exclude hoistway learn and save parameter, system returns to main menu by striking it.

Enter: enter into next menu, confirm changing parameter and instruction register

Esc：return to last menu and cancel key

＞:cursor key, system enters into communication state by strike it in main menu.

∧: page up, increase 1 or select yes(on) key

∨: page down, decrease 1 or select yes(on) key

3.3 LCD display and parameter operation flowchart

Main flow chart
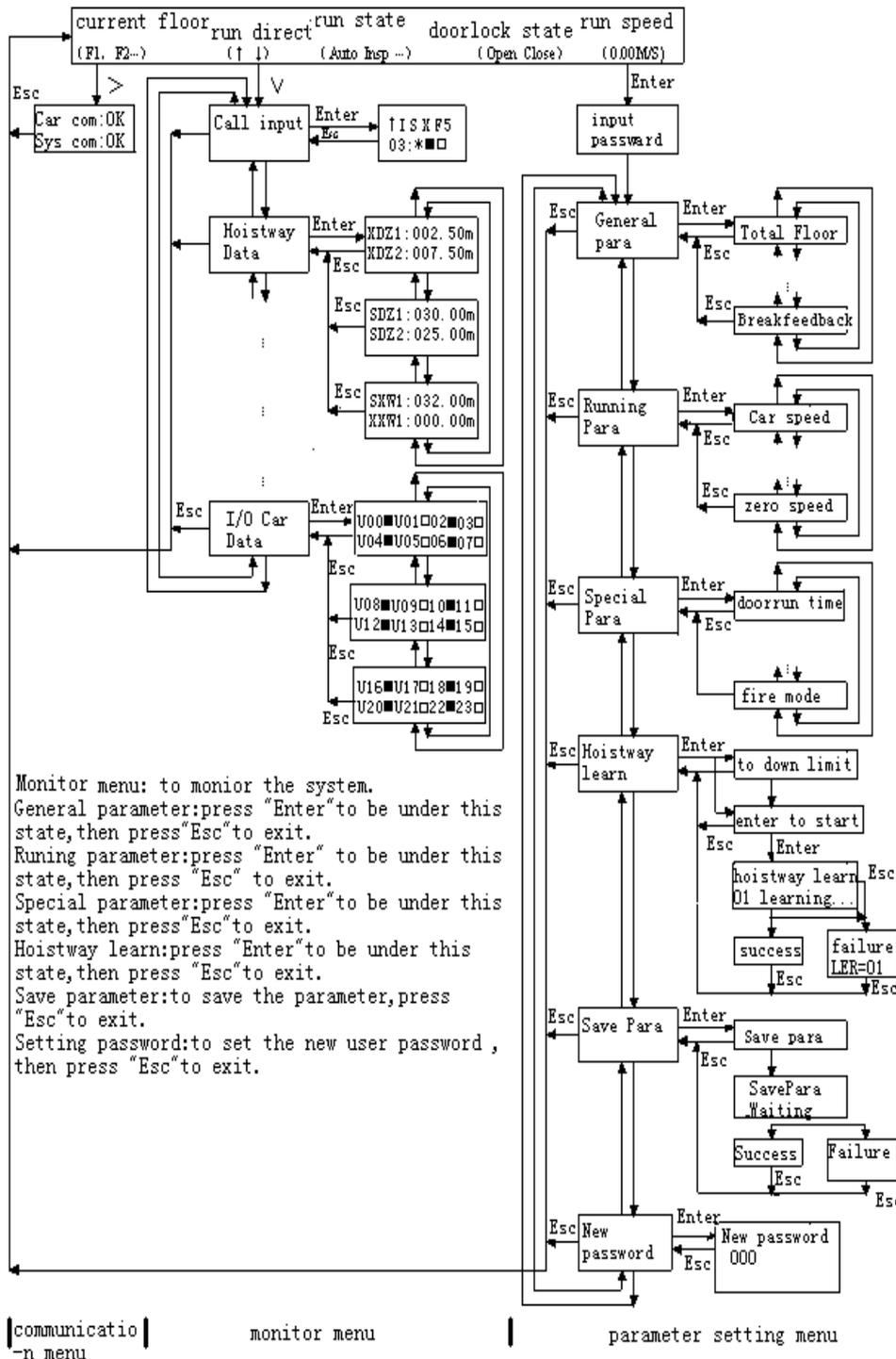
Monitor menu: to monior the system.
General parameter:press "Enter"to be under this state,then press"Esc"to exit.
Runing parameter:press "Enter" to be under this state,then press "Esc" to exit.
Special parameter:press "Enter"to be under this state,then press"Esc"to exit.
Hoistway learn:press "Enter"to be under this state,then press "Esc"to exit.
Save parameter:to save the parameter,press "Esc"to exit.
Setting password:to set the new user password , then press "Esc"to exit.

3.3.1 main menu

It displays current floor, running direction, running state, fault code, door lock state and running speed.
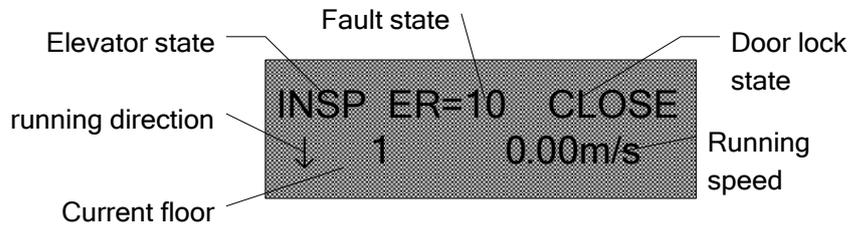
Elevator state: insp, manu, auto, fire, park and spci.

Fault state: if there is fault, it displays ER=#, otherwise, it displays nothing.

Door lock state: close and open

Current floor: actual floor

Definition：

Actural floor — floor displaying, set via menu3.4.2(13);

Absolute floor — bottom floor is 1 floor, second floor is 2 floor, the third floor is 3······

3.3.2 communication state

system enters into communication state by strike ＞ in main menu
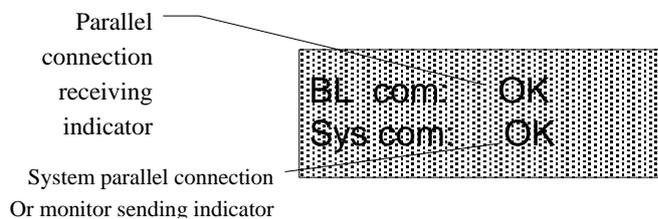
➢ BL com：

"OK" — parallel receiving communication normal;

"ER" — paralle receiving communication error, when indicating number, it means the times of error communication.

➢ Sys com：

"OK" — main board parallel connection or monitor communication sending normally;

"ET" — parallel connection or monitor sending error, when indicating number, it means the times of error communication.

3.3.3 verify password

Before you set and save parameters, you must input right password in inspection state (user password may be modify in setting password menu). If you want to set parameters in 3.3.4(b), you must input factory password, which is set before leaving factory and can't be modify. User's passwoard ("0000" ex works value) and factory passport ("1000" ex works value) may be modified in setting password menu (refer to 3.3.7)

【**Operation** 】

1） In "main menu" , pressing "enter" key, if LCD is not in "main menu", pressing "menu" to return to "main menu", then pressing "Enter" key.

```
Input Password    0000
                 Enter

```
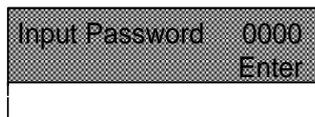
2） Into "input passport" menu, pressing "∧""∨" key to modify, then pressing">" to set. If password is correct, press "Enter" key enter into "General Para" menu.

```
        General para
                Enter
```
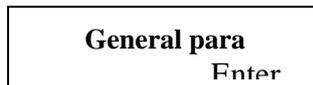
3） If password is not correct, the LCD will display as below:

```
Password error
             Enter

TZD
```
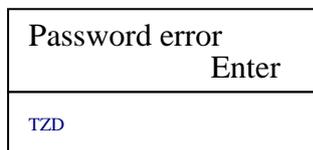
4） Press "Enter" key to return to the first step, utill inputing the correct password, then pressing "Enter" key into the second step

3.3.4 monitor menu and setting parameter menu

Monitor menu, general parameter, running parameter and special parameter are basic of elevator debugging. Menu is divided into user menu and factory menu by user's requirement. The flowchart is as following:

）User's menu

Monitor Menu	General Para	Running Para	Special Para
Call Input	Total Floor	Car Speed	Door Run Time
Hoistway Data	Homing Floor	Motor Speed	Factory Menu
Floor Data	Set Time	Pulses	
Speed Feedback	Open Door Time	Insp Speed	
I/O Value	Open Delay Time	Leveling Speed	
Run Report	Homing Time	Star Speed	
Fault Report	Start Time	Least Speed	
Encoder Apprais	Stop Time	Break On Time	
Input Apprais	Factory Menu	Break Off Time	
Software No		Factory Menu	
Factory Menu			

b） Factory Menu

Monitor menu	General Para	Running Para	Special Para
User menu	User Menu	User Menu	User Menu
I/O Input	Fire Floor	Acceleration b1	Factory Para
I/O Output	Parking Floor	Deceleration b2	Twins Control
I/O Car Data	Input Type	S Curve P1	Far Monitor
	Output Type	S Curve P2	Two Door Mode
	Set Indication	S Curve P3	Fire Mode
	Set Stop Floor	S Curve P4	Parallel No
	Open Stop Floor	Zreo Speed	Jog Select
	Break Feedback	Leveling Adj	Multi Set
	Door Select		Multi Speed Give
	Input Select		Decel Distance
	Output Select		Over Time

c） Parameter Narrative

（1）Monitor Menu： monitor menu: all the interfaces are read only except floor select menu and close/open door menu.

3-1

User Menu		
No.	Name	note
1	Call Input	note
2	Hoistway Data	It displays car call, landing call and inter select
3	Floor Data	It displays top/bottom limit and terminal
4	Speed Feedback	Leveling position and stop or not
5	I/O Value	Motor speed (rpm) and elevator speed (m/s)
6	Loading data	I/O state corresponding to decimal.
7	Run Report	Current load percentage (load device is valid)
8	Fault Report	Accumulated running time
9	Call test	The latest 10 fault records
10	Interfer apprais	Test communication between main board and landing call box
11	Encoder Apprais	Valuate EMI
12	Input Apprais	Valuate coder interference and quality of pulse
13	Software No	Display input interference
Factory Menu		
11	I/O Input	Input port state
12	I/O Output	Output port state
13	I/O Car Data	COP input/output state

（2）General Para：

3-2

User Menu				
No.	Name	Default	Range	Note
1	Total Floor	——	1-12	Elevator total floors (equate to number of shelter board)
2	Homing Floor	1*	1- total floors	Elevator return to homing floor without call
3	Set Time	——		Display and set system time
4	Open Door Time	3s*	0-599s	Wait for close door in automation state
5	Open Delay Time	30s*	0-599s	Open door delay time (open door delay enable)
6	Homing Time	60s*	0-599s	Wait for return to homing floor time without call

7	Start Time		00：00*		Start run time (electronic lock on)	
8	Stop Time		00：00*		Stop run time (electronic lock on)	
Factory menu						
9	Fire Floor		1*	1—total floors	Fire return floor	
10	Parking Floor		1*	1—total floors	Electronic lock off return floor	
11	Input Type		ON		Electric level select, on for low level, off for high level.(note: for top/bottom limit,input ON meaning high level, OFF meaning low level)	
12	Output Type		OFF		Output relay, off- open, on-close	
13	Set Indication		00—12		Display character	
14	Set Stop Floor		ON		Stop or not	
15	Open Delay Able		NO*		Open door delay enable	
16	Break Feedback		Yes*		Yes—brake feedback; no—no brake feedback	
17	Door Select				Front/back door select	
18	Input Select		0—23		Set every input terminal	
19	Output Select		0—15		Set every output terminal	
20	Show Select		0	0—3	0:Seven Segment code,1:BCD code,2：Grey code，3: dot to dot	

（3）Running Parameter：

3-3

User Menu					
No	Name		Default	Range	note
1	Car Speed		1.6m/s	0.5-1.75m/s	Elevator speed
2	Motor Speed		——	1-9999r	Motor rated speed
3	Pulses		——	500-9999	Input into main board pulse
4	Insp Speed		0.3m/s*	0.01~0.6m/s	Inspection running speed
5	Leveling Speed		0.3m/s*	0.01~0.6m/s	Leveling speed ☆
6	Star Speed		0.0 m/s*	0.0~0.2m/s	Start speed ☆
7	Least Speed		1m/s*	0.01~1.0m/s	Min speed curve steady value ☆
8	Break On Time		50ms*	10~9990ms	Time between Release and run
9	Break Off Time		50ms*	10~9990ms	Time between zero speed and brake
Factory menu					
10	b1	Acceleration b1	0.6*	0.1-9.99	Acceleration
11	b2	Deceleration b2	0.6*	0.1-9.99	Deceleration
12	P1	S Curve P1	0.7*	0.1-9.99	S time1 ☆
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	Zero speed	Zero Speed	5rpm*	0-9999	Zero speed
17	Leveling adjustment	Leveling Adj	50mm		Leveling offset

Elevator rated speed, motor rated speed and number of coder pulse are the important parameters. They should be set by nameplate. If one of them is changed, hoistway learn must be perform before system normally runs. When main board input pulse is dividing frequency, number of coder pulse is calculated pulse.

Notice: number of coder pulse > 500, gearless motor number of coder pulse >4096. 6kHz<f<25kHz.

e.g. coder: 1024, 2 dividing frequency, number is 1025/2=512.

The relationship between motor rated speed and elevator speed is:

Elevator rated speed = (motor rated speed* **traction wheel diameter***3.14*driving ratio)/(60*1000*traction ratio)

e.g. motor rated speed = 1370rpm, **traction wheel diameter=590mm,**driving ratio = 2/53, traction ratio = 1/1;

Elevator rated speed = (**1370*590***3.14*2)/(60*1000*1*53)=1.6m/s

（4） Special Parameter：

3-4

User Menu					
No	Name		Defai;t	Range	Note
1	Door Run Time		5s*	0-999s	Close/open door relay holding time
Factory menu					
2	Factory para		NO		Restore default
3	Twins Control		0*	0-1	optional
4	Far Monitor		0*	0-1	Far monitor enable and telephone number (optional)
5	Two Door Mode		0*	0-5	Optional
6	Fire Mode		0*	0-1	optional
7	Parallel No		0*	A/B	Parallel enable, one is A, the other is B
8	Jog Select		No*	Yes/No	No:no jog output; 1:job output
9	Multi Spees mode		Yes	Yes/No	Yes: multi speed given; no: analog given
10	Multi Speed Give		0*	0~4m/s	Set speed
11	Decel Distance		0*	0~10m	Decelerate distance
12	Over Time		45*	0~999s	Running time
13	function select		OFF	ON/OFF	For special function select

Notice: * parameter is default parameter

☆ parameter is for simulation use。

3.3.5 hoistway learning

Elevator must perform hoistway learning before it normally runs
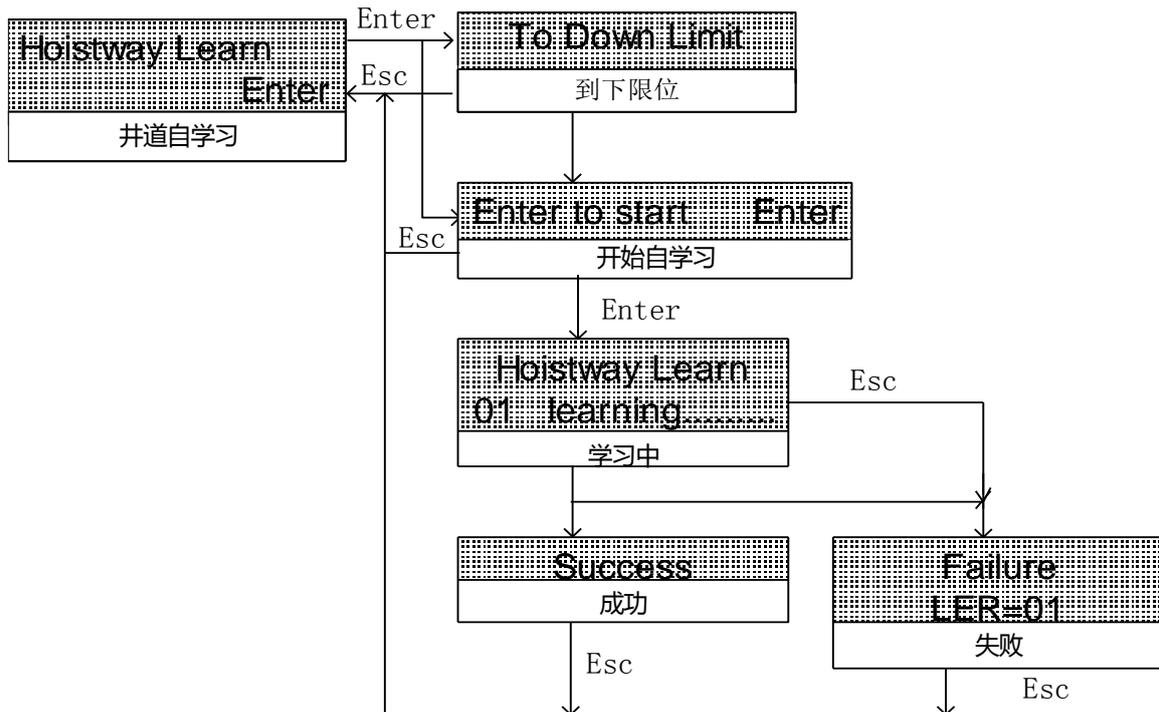
Hoistway learn is perform in inspection state and car box press bottom limit switch. If car box doesn't locate bottom limit, 'to down limit' is displayed, otherwise, 'enter to start' is displayed, strike 'enter' key, it performs hoistway learning until top limit. If it success, 'success' is displayed, else 'failure ler=#' is displayed. It is processed by fault coder and repeats learning. It will exit if you strike 'esc' key, 'ler=15' is displayed, it exit by strike 'esc' again.

Hoisway learn is under condition that:
1. top/bottom limit and terminal and shelter board are fixed.
2. up/down leveling zone switch and shelter board are fixed.
3. safe circuit and lock circuit are normal.
4. general parameter and running parameter are set
5. elevator may be inspected.

3.3.6 save parameter
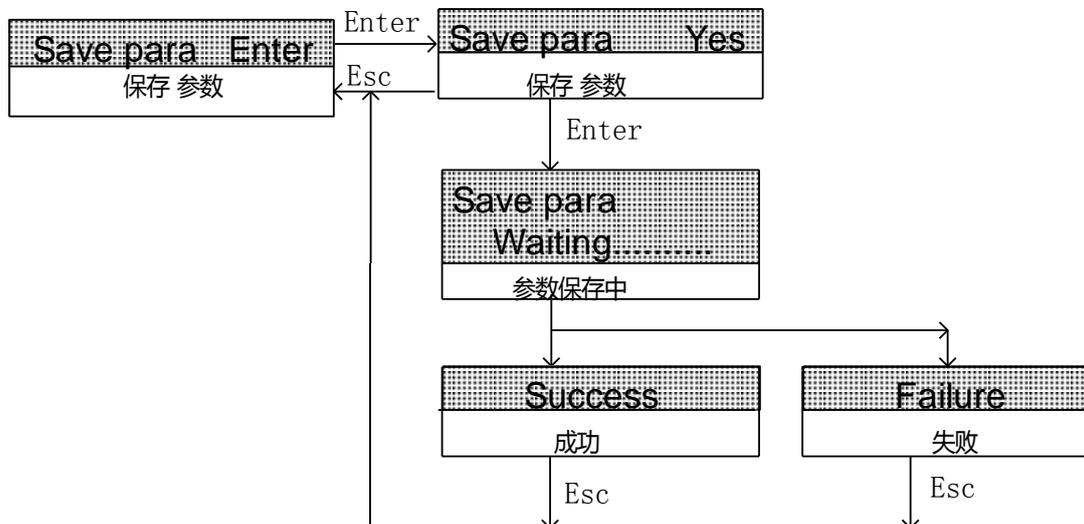
System automatically saves modify parameter if you select yes in save parameter menu and strike 'enter' key. If it success, 'success' is displayed, else 'failure' is displayed. Please contact with factory.

Notice: Modify parameter is valid at once, but if they will be lost if you don't save them

3.3.7 password setting

➢ User may modify password.

➢ Modify user password：input user password when checking password (3.3.4), enter into password setting menu to modify the user password.

➢ Modify factory password：input factory password when checking password (3.3.4), enter into password setting menu to modify the factory password.
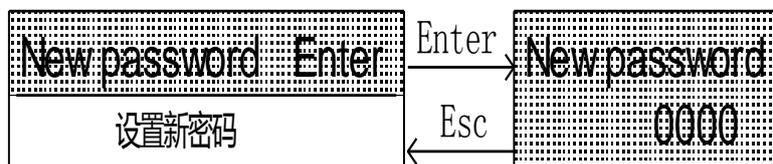
3.4 windows operation

User menu are open to the users who have user password.. Factory menu are open to whom have factory password. The default password for user is "0000", and the default password for factory menu is "1010"

Notice:

1. When 'enter' is displayed on bottom right corner on LCD, you may strike 'enter' key enter into sub-interface.

2. If there isn't cursor, you can't set parameter.

3. When you strike 'enter' key and cursor is displayed, you can modify parameter by ' $\wedge$ ' and ' $\vee$ ', move cursor by ' $>$ '.

Noun explanation:

1. actual floor: display floor

2. absolute floor: bottom floor is 1.

3.4.1 Monitor Menu and Operation

In main menu interface, press " $\vee$ " key to enter into monitor menu, then press" $\wedge$ " or " $\vee$ " again to check the content of monitor menu; the sequence of sub menu for monitor menu are as below:

 (1) call floor information

It display car call and landing call, car call may select in menu.

【Opeartion】

1）It will enter into the first page of monitor menu by striking ' $\vee$ ' key from main menu.

2）Press Enter key to enter select floor
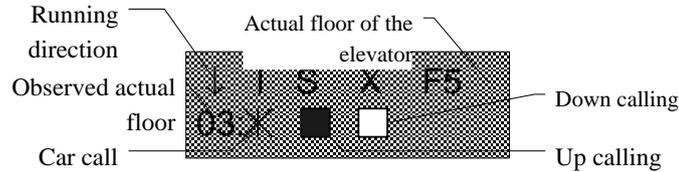
3） You may select observation floor by '∧' and '∨'. '∧' and '∨' are current running direction. '*" twinkling represents car call, you strike 'enter' to select car call in debugging. '□' represents no landing call, '■' represents landing call. 'F-XX' is current floor.

4）It will return to main menu by strike 'esc'

（2）hoistway switch position

It displays the position of top/bottom limit switch and top/bottom terminal. It start from bottom limit. Unit is meter.. After hoistway self-learing, the control system will automatically record and save shaft switch data; when changing the shaft switch position, we must have a new shaft self-learing.

【Operation】

1）It will enter into the 2nd monitor item by strike '∨'key from instruction menu

2）Strike "Enter" into shaft switch position menu:

XDZ1 002.50m
XDZ2 007.50m

SDZ1 030.00m
SDZ2 025.00m

SXW1 032.00m
XXW1 000.00m

Bottom terminal 1
Bottom terminl 2
Top terminal 1
Top terminal 2
Top limit
Bottom limit
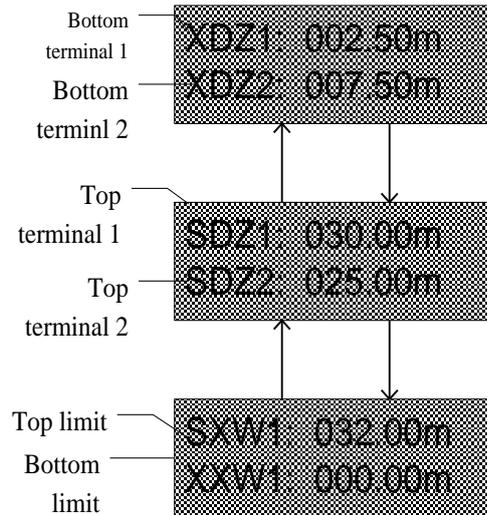
3）Select item by '∧' and '∨' key.

4）Press Esc key to shaft switch position main menu

Select item by "∧"、"∨" in monitor menu.。

（3） floor information

The 1st line is stop information (□: not stop; ■: stop).

The 2nd line is actual position of floor.

Press "∧" or "∨" to check the floor information.

Floor Data   Enter

2   Stop
Data 010.00m

Observed actual floor
Stop information
Enter
Esc
The position of observed floor
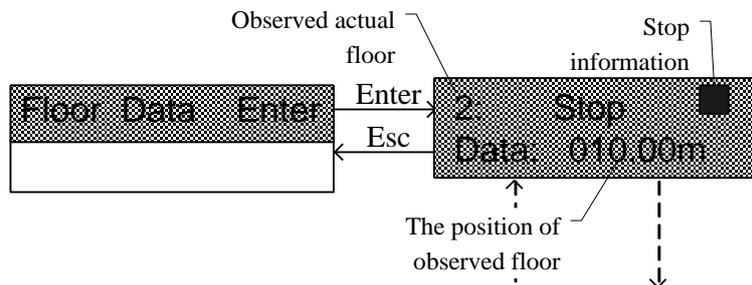
(4) speed feedback

It displays elevator and motor speed.

Speed Feedback
Enter

0.30m/s   0200rpm

elevator speed   Motor speed
Enter
Esc
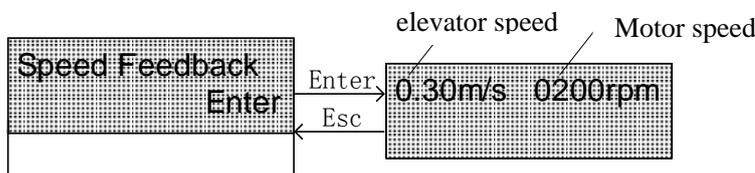
(5)I/O combination

The data is decimal, which represents the I/O port state by corresponding binary.

I/O State   Enter

IN :   00000322
OUT: 00000322

Input
Output
Enter
Esc
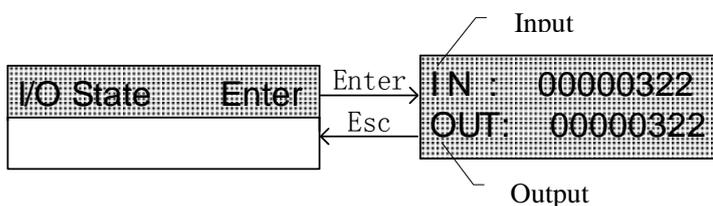
```
e.g.:  Decimal:    IN=00000322,    OUT=00000322
          Binary:  IN=101000010,   OUT=101000010
X0  X1  X2  X3  X4  X5  X6   X7  X8  X9   X10 X11
0   1   0   0   0   0   1    0   1   0    0   0
X12 X13 X14 X15 X16 X17 X18  X19 X20 X21  X22 X23
0   0   0   0   0   0   0    0   0   0    0   0
Y0  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
```

running record

(6)It is accumulated time and times
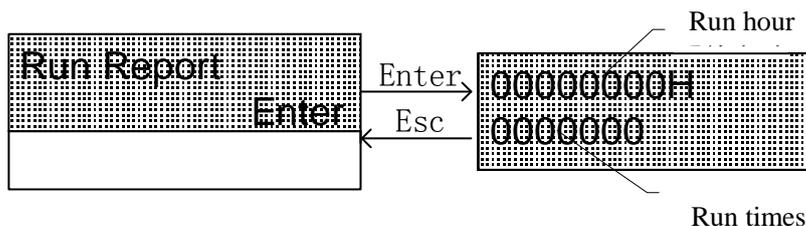
(7)fault record
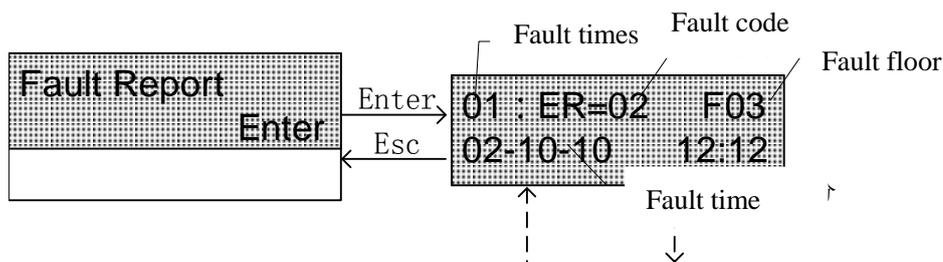
It records type and time of the latest 10 faults. Which is selected by '∧' and '∨'

(8) coder evaluation
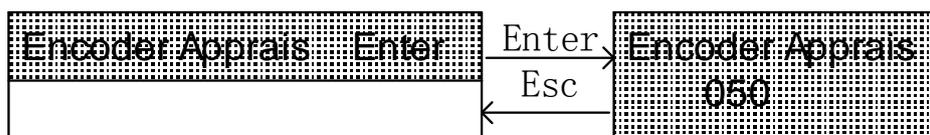
When elevator speed is steady, the data is bigger and the quality of coder sigal is worse.

(9) input signal evaluation – input port interference

Inner state before 10 times   Input state

| Input Apprais |
| Enter |

→ 01:00000000234
X01:----- □

Input port   Stick-map
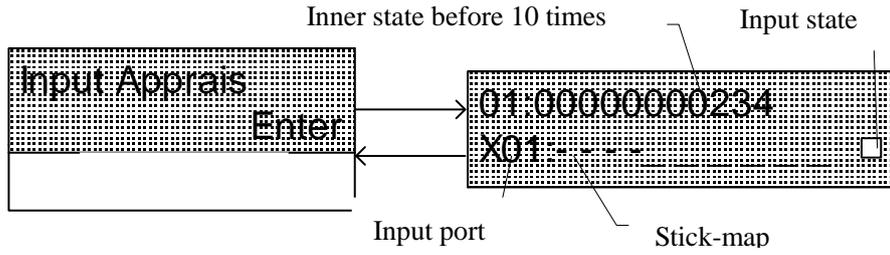
The bar represents input port logic level. High: 1, low: 0. If the numbers of 1 is more close to the number of 0, the interference is more intense.

(10) software version

It is software version.

| Software No   Enter | Enter→ | Software No |
| | ←Esc | 159 |

(11) input signal

| I/O   Input |
| Enter |

Enter→
←Esc

| X00■X01□X02 ■x03 □ |
| X04■X05□X06 ■X07 □ |

↑ ↓

| X08■X09□X10 ■x11 □ |
| X12■X13□X14 ■x15 □ |

↑ ↓

| X16■X17□X18 ■x19 □ |
| X20■X21□X22 ■x23 □ |
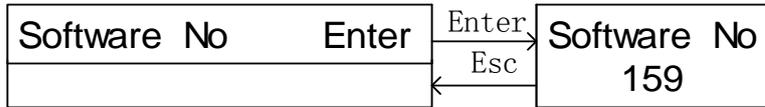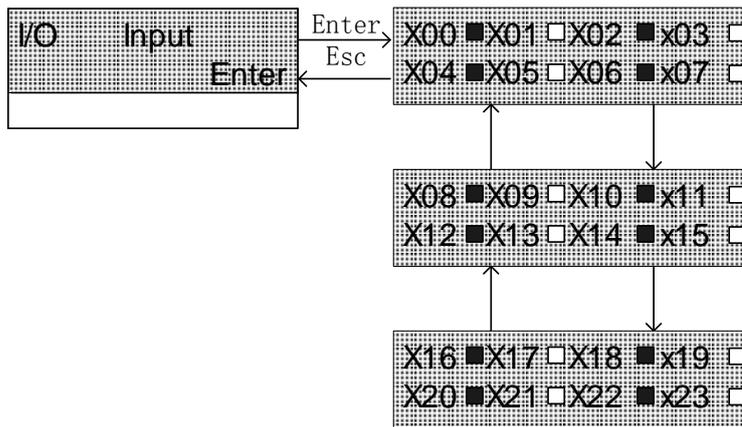
□: input 0; ■: input 1; □: light off ; ■: light on

(12) output signal

| I/O   Output |
| Enter |
| $\frac{4}{1}$ |

Enter→
←Esc

| Y00■Y01□Y02 ■ Y03□ |
| Y04■Y05□Y06 ■ Y07□ |

↑ ↓

| Y08■Y09□Y10 ■ Y11□ |
| Y12■Y13□Y14 ■ Y15□ |

↑ ↓

| Y16■Y17□Y18 ■ U19□ |
| Y20■Y21□Y22 ■ Y23□ |
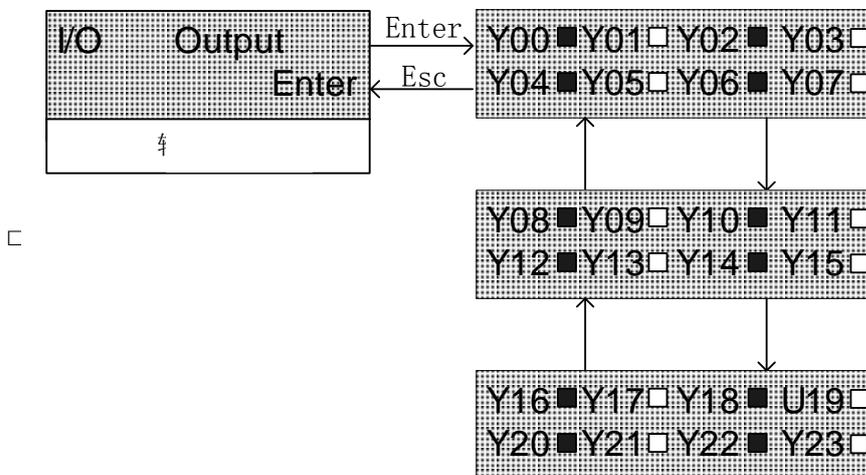
(13) car box signal

[
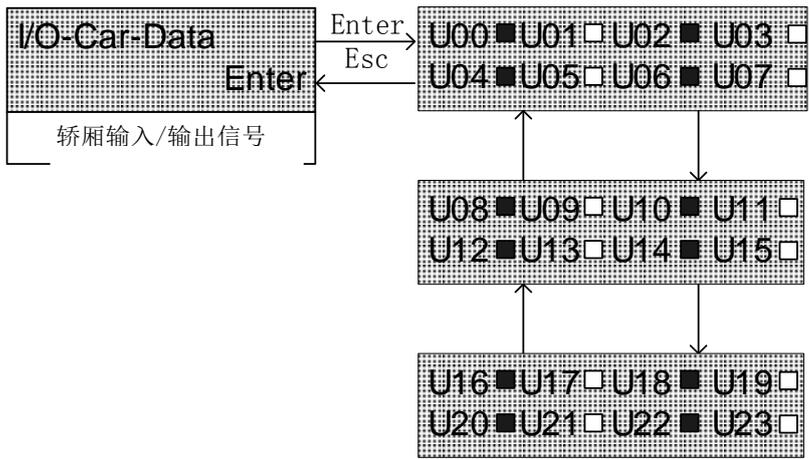
No.	definite	No.	definite
U00	Close door button 1	U10	Attendant switch
U01	Open door button 1	U11	Stand by
U02	Close door button 2	U12	Not stop
U03	Open door button 2	U13	Full load switch
U04	Close door limit 2	U14	Light load switch
U05	Open door limit 2	U15	Over load switch
U06	Close door limit 1	U16	Empty load switch (stand by)
U07	Open door limit 1	U17	Safe board switch 2 (two door mode)
U08	Special switch	U18	Safe board switch
U09	Open door delay button	U19~U23	Stand by

□: invalid,0 ; ■: valid, 1.

Note："0" and "1" have no relation with valid electric level setting of input (refer to 3.4.2(11))

3.4.2 general parameter operation

【**operation** 】

Before you set parameter, you must input right password (user password /factory password).

When you enter into input password menu, '＞' select bit, '∧' and '∨' modify data, if password is right, it will display general parameter menu, otherwise, input password again.

```
Password error
Enter
```

```
General para
Enter
基本参数
```

(1) total floors

Setting total floor range as 1-12

```
Total Floor    12
总楼层数
```

【**Operation**】

1）When you strike 'enter' key, bottom right corner number twinkle, you can modify parameter；

2）After modifying, press "enter" to confirm the changing. But is has not been saved, if power failure, the data will be

Lost (restore to defult value)

3）After modifying, press " esc" to cancel this changing and restore to the previous value

Note： ① Total floors are equal to shelter board in hoistway.

② After modifying the data, we should save the parameter accordingly.(refer to3.3.6)

（2） homing floor

➢ Elevator returns to homing floor, if there aren't car call and landing call, the setting way is same as above;

➢ This indicating floor is actual floor, that is to say that this floor is complied with "floor/stop set" (3.4.2.(13))

```
Homing Floor    1
待梯楼层
```

（3）System time

> ➢ Display and set system time (24 hour)
> ➢ Format: year-month-day hour: minute

```
Set Time
00-00-00    00:00
```
时间设置

（4） open door holding time

It is elevator open door holding time in automation state. Open door time is adjusted by the reason of stop. If there is either car call or landing call, it is this time; if there are both car call and landing call, it is this time plus 2s.

```
Open Door Time
000s
```

(5)open door delay time

The open door time may be prolonged by push down open door delay switch if this function is enabled. Unit: second.

```
Open Delay Time
000s
```
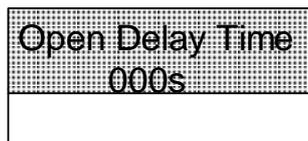
(6)return to homing floor time

automatically return to homing floor.

```
Homing Time
000s
```

]
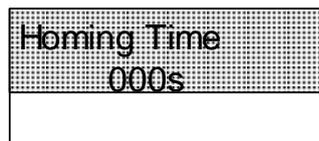
(7)automatically start service time

Elevator will start service at this time. (electronic lock is on)

```
Start Time              Enter    Start Time
          Enter      ───────►    07:00
                        Esc
                     ◄───────
```
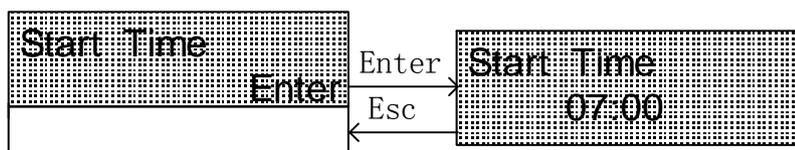
(8) aut ... Elevator will stop service at this time. (electronic lock is on).

```
Stop Time               Enter    Stop Time
          Enter      ───────►    18:00
                        Esc
                     ◄───────
```
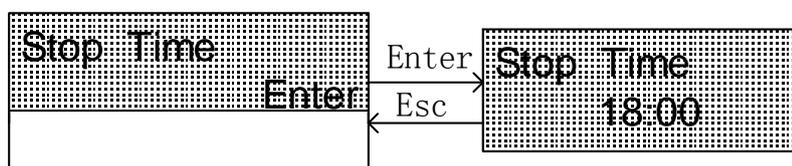
If start time is equal to stop time, this function is valid.

(9) fire floor

When elevator receives fire signal, it clears all call and return to fire floor.

```
Fire Floor        01
```
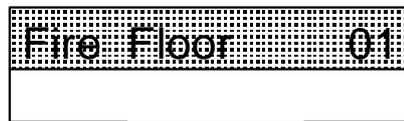
(10) parking floor

When elevator stops service in normally running, it returns to parking floor and stops service.

```
Parking Floor   01
```

(11) input logic level

When input port is needed low level is valid, it is set 'on'; when input port is needed high level is valid, it is set 'off'. (no connection is high)
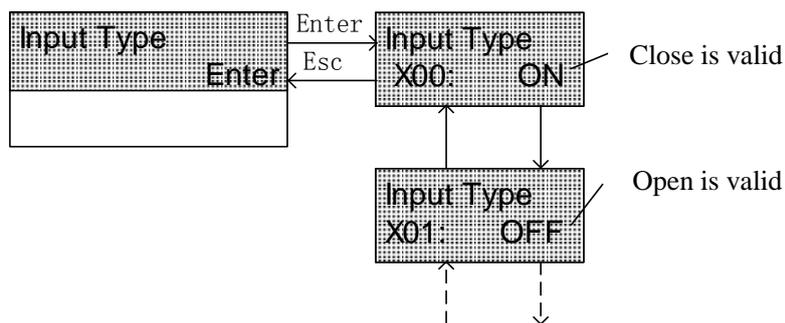
Marker	Terminal no.	Terminal location	Definition
X22	X22，X23	J14-2，J14-4	Emergency input
X23	X24，X25	J14-8，J14-10	Door interlock input
U04-U07	I1，I2，(I2，I3)	J4-4，J4-5，（J3-3，J3-4，BL2000-EBB）	Door opne limit 1input., door close limit 1 input, door open limit 2 input, door close limit 2 input
U17-U18	I3，(I5)	J3-6，(J3-5, BL2000-EBB)	Safety edge 1input, safety edge 2 input
U13	I6	J4-9	Light load input
U14	I5	J4-8	Full load input
U15	I4	J4-7	Overload input

Notice: 'ON': limit switch is constant close.

'OFF': limit switch is constant open.

(12)output relay contactor

off: constant open

on: constant close.

Default: off

```
Output Type          Enter    Output Type
            Enter   ←——————   Y00:      OFF
                     Esc
```

```
                              Output Type
                              Y01:       ON
```
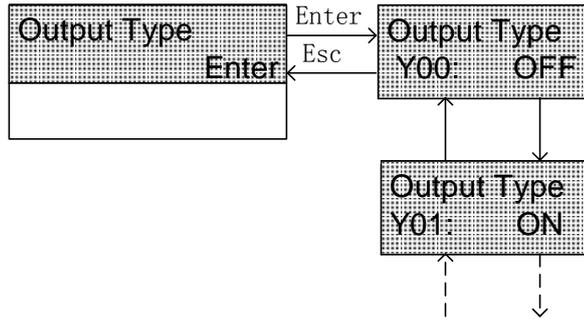
Notice: Y12 is ON for Fuji transducer .

(13)indicator character

Indicator character may be letter or figure.

```
Set Indicatioo       Enter    Set Indicatioo
            Enter   ←——————   01:         -1*
                     Esc
                              loor
                              oor
                              Set Indicatioo
                              02:          1*
```
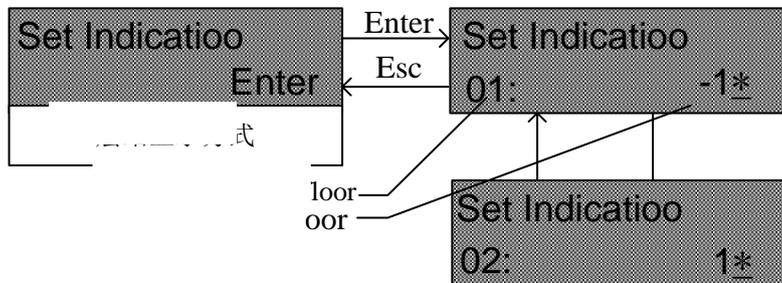
(14) stop floor

set every floor is stop or not. (ON: stop, OFF: don't stop)

```
Set Stop Floor       Enter    Set Stop Floor
            Enter   ←——————   1:         ON
                     Esc
                 Absolute floor
                              Set Stop Floor
                              2:         OFF
```
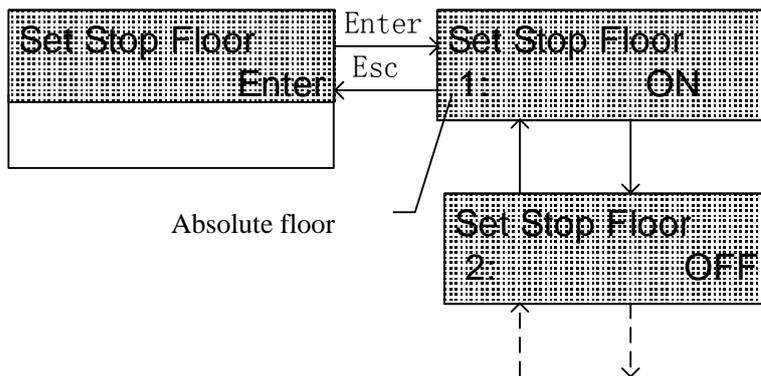
(15) open door delay enable

It is used to set open door delay enable/disable.

```
Open Delay Able      Enter    Open Delay Able
            Enter   ←——————
                     Esc
```
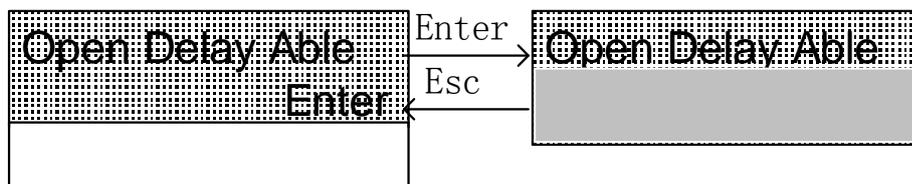
(16) brake feedback detect enable

Break Feedback Enter → [Enter / Esc] → Break Feedback Yes
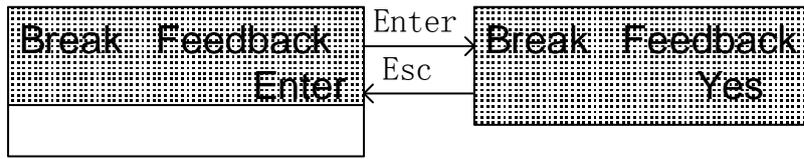
Yes: system detects brake feedback.

No: system doesn't detect braking feedback

We suggest that detect switch be fixed on traction motor and feedback signal input into the system. Feedback detection is enabled.

(17) two door mode

Door Select Enter → [Enter / Esc] → Door Select n．d1=x d2=x
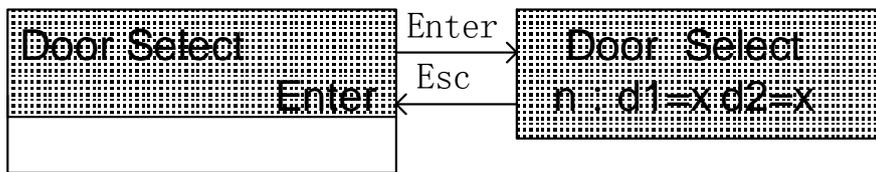
n: floor

d1: front door

d2: back door

x=Y: this door act

x=N: this door don't act.

For example: two door elevator, 6th floor, only front door act; 7th floor, both front door and back door act.

```
Door    Select
6：d1=Y   d2=N
```

```
Door    Select
7：d1=Y   d2=Y
```
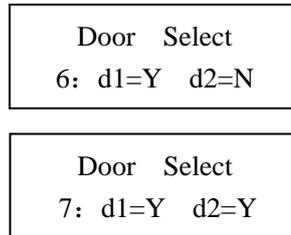
Note："door select" parameter should be used with "two two mode"（3.4.4（5））together.

（18）multi-function input setting

Input Select Enter 多功能输入设置 → [Enter / Esc] → Input Select X0: 0 → [Enter / Esc] → Input Select X0: 0

Input Select X1: 1 → [Enter / Esc] → Input Select X1: 1

功能号

端口号

Muti function input port range: X0-X21.

The multi function no. of port can not be repeated.

Note: under "multi-function setting"，if you want to set one function whose input points have been in existence，the system will display all input points responding to this function. For example, provided,X1 has been set "1"（up-run input），after that if we try to set X0 as "1"and press "Enter" ，the system will display : X1 already set 1. The function no. of X0 will be kept as previous value.. So if intend to send X0 as "1", we need to set X1 as other function no. or "21"（standby input)

Multi-function input table:

Function No	define	Function No	define
0	Inspection input	11	Inverter faulty input
1	Up-run input	12	Fire input
2	Down-run input	13	Emergency stop input 1
3	Up-terminal station 2 input	14	Door interlock 1 input
4	Down-terminal station 2 input	15	main contactor input
5	Up-limit input	16	auxiliary contactor input
6	Down-limit input	17	Brake feedback input
7	Up-terminal station 1 input	18	Standby input
8	Down-terminal station 1 input	19	Inverter running input
9	Up-leveling input	20	Electric interlock input
10	Down-leveling input	21	Standby input
22	Temperature sensing switch input		

（19）multi-function output setting

Multi-function output port range: Y1-Y15

multi-function output table

Function No	define		Function No	define
0	Acceleration/ deceleration time 2		**8**	Main contactor output
1	Fire linkage		9	auxiliary contactor output
2	Open 2 contactor control output		10	Inverter up-run output
3	Close 2 contactor output		11	Inverter down-run output
4	Open 1 contactor control output		12	Inverter enable output
5	Close 1 contactor control output		13	Multi-speed1 output
6	Brake control output		14	Multi-speed2 output
7	economical resistor control output		15	Multi-speed3 output

Note: whether the port COM is suitable to the multi-function output setting.

（20）output code display mode

Output code mode of L1~L9 of Micro processor board are 7 segment code in default. These parameters can be set as BCD code and grey code etc

编码方式
0：七段码
1：BCD码
2：格雷码
3：点对点
4：二进制
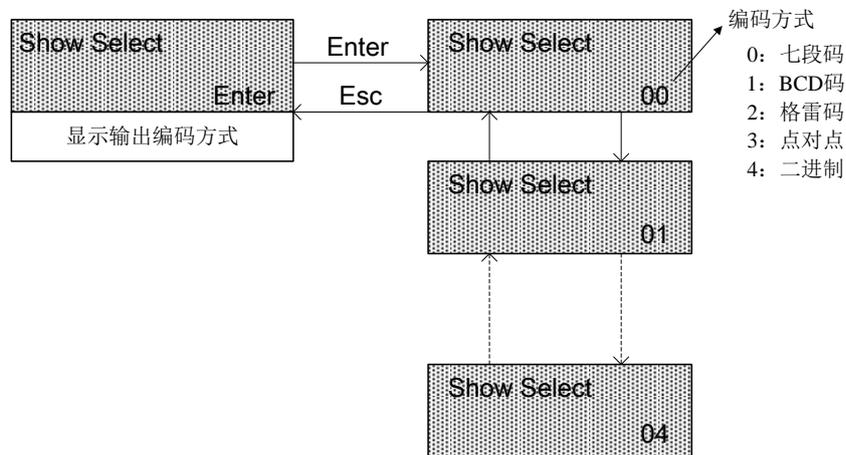
0: seven segment code, 1: BCD code, 2: grey code, 3: dot code, 4, binary system

When output codes are set as 1,2,3,4, the output corresponding relations are as below chart：

3-9

Code	Port no.								
	L1	L2	L3	L4	L5	L6	L7	L8	L9
1、2、4	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	inspection	-
3	1floor	2 floor	3 floor	4 floor	5 floor	6 floor	7 floor	8 floor	-

3.4.3 running parameter operation

It is used to set running parameters.

```
Runing para
            Enter
```

(1) elevator rated speed

It is elevator rising speed, which can be set traction motor by nameplate or calculation from motor rated speed, driving ratio and traction wheel diameter.

```
Car Speed
        1.60m/s
```
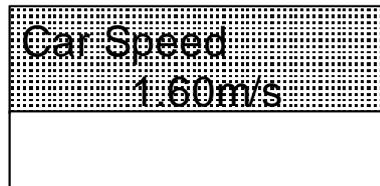
(2) motor rated speed

It is set by nameplate.

```
Motor Speed
        1350rpm
```

(3) number of coder pulse

The number of coder pulse is inputted into main board pulse. It's range from 6kHz to 25kHz, if it is larger than 25kHz, it should be divided.

```
Pulses  024  PPR
```

Notice: elevator rated speed, motor rated speed and number of coder pulse are the important parameters. They should be set by nameplate. If one of them is changed, hoistway learn must be perform before system normally runs.

(4) inspection running speed

It shouldn't be bigger than 0.6m/s.

```
Insp Speed 0.30m
```

(5) crawling speed

When elevator doesn't stop at leveling zone for fault, it should be automatically crawling to leveling zone if safe circuit and transducer both restore normally. Crawling speed is range from 0.01 m/s to 0.6m/s.

```
Leveling speed
     0.30m/s
```

(6) start speed

```
Star Speed
 0.00m/s
```
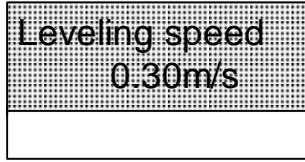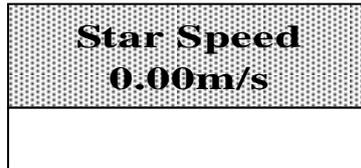
(7) single floor running speed

When elevator speed is higher than 1.5m/s, single floor running speed is different from multi floor running speed. It determines the smallest height of floor. If height is too small, speed should be reduced. It is range from 0.8m/s to 1.0m/s

```
Least  Speed
     1.00m/s
```
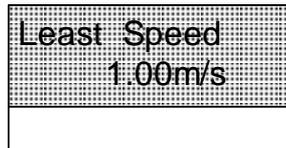
(8) ahead time for release brake

Passenger will feel more comfortable by adjusting it, system may adapt to all kinds of responding time traction motors.

```
Break On Time
    50ms
```
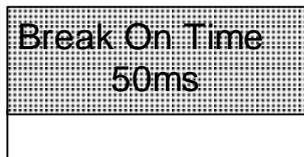
(9) braking time

when System brakes, it outputs block torque by adjusting braking time. It really brakes at zero speed.

```
Break Off Time
     50ms
```
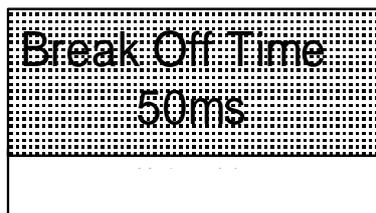
(10)b1 acceleration slope
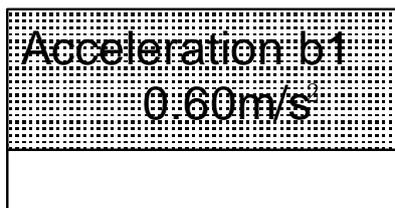
```
Acceleration b1
      0.60m/s²
```

(11) b2 deceleration slope

```
Deceleration b2
      0.60m/s²
```

(12) P1: s time 1

```
S Curve P1
      0.60m/s²
```

(13) P2: s time 2

```
S Curve P2
      0.60m/s²
```

(14) P3: s time 3

```
S Curve P3
      0.60m/s²
```

(15) P4: s time 4

```
S Curve P4
   0.60m/s²
```
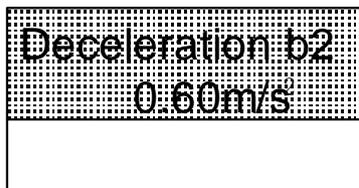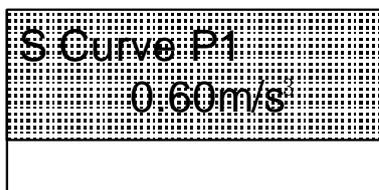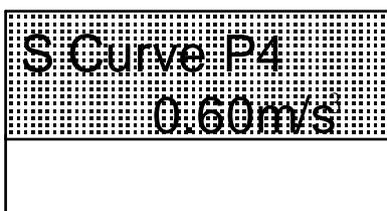
B1,b2,p1,p2,p3 and p4 are used to adjust running curve. Passenger will feel more comfortable by adjusting these six parameters (besides transducer parameters). Parameter is increased, curve slope becomes bigger; parameter is deceased, curve slope becomes smaller. Elevator can meet standards by adjusting them
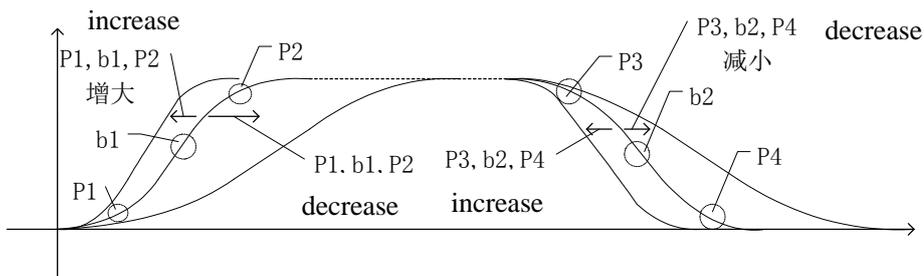
(16) zero speed

When elevator speed is lower than it, system regards elevator speed as zero and outputs braking signal.

5 rev/second
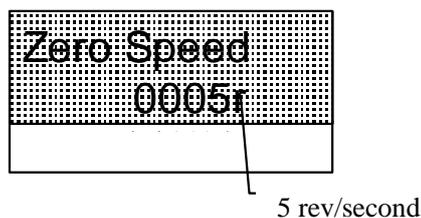
(17) leveling adjustment

When elevator stops at different position for up/down running, this parameter should be adjusted (The position of up-running is higher than down-running, this parameter should be deceased; otherwise, it should be increased.). Amplitude is half of the difference (default is 50mm).
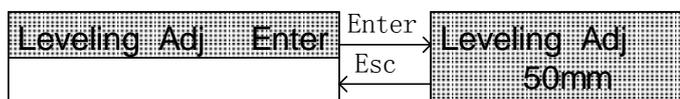
3.4.4 special parameter

It is used to set special parameter.
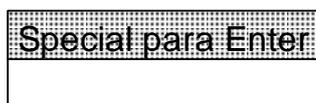
(1) open/close door relay holding time

It is holding time of open/close door command. When there aren't open door limit and close door limit, relay holding time is determined to this parameter. When there are open door limit and close door limit, it is 1 second longer than actual time.

5second
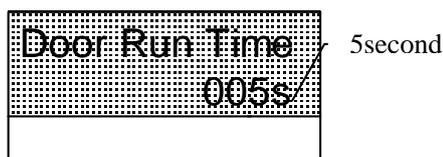
(2) restore default

When system parameters are disorder, you can restore default to debug again.

```
┌─────────────────────────────┐  Enter  ┌─────────────────────────────┐
│ Factory para      Enter     │────────▶│ Factory para                │
│                             │  Esc    │            Yes      or      │
│                             │◀────────│                             │
└─────────────────────────────┘         └─────────────────────────────┘
```
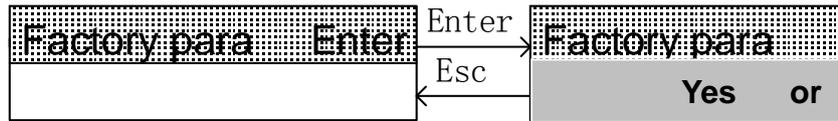
(3) parallel enable

1: parallel running; 0: single running.

```
┌─────────────────────────────┐  Enter  ┌─────────────────────────────┐
│ Twns Control    Enter       │────────▶│ Twns Control                │
│                             │  Esc    │              Yes / No       │
│                             │◀────────│                             │
└─────────────────────────────┘         └─────────────────────────────┘
```

(4) group enable

1: group running; 0: single running. (it is only provided by custom requirement)

```
┌─────────────────────────────┐  Enter  ┌─────────────────────────────┐
│ Group Control    Enter      │────────▶│ Group Control               │
│                             │  Esc    │            Mode   1         │
│                             │◀────────│                             │
└─────────────────────────────┘         └─────────────────────────────┘
```
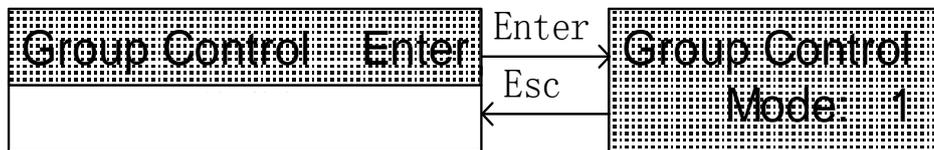
(5) far monitor

1: far monitor; 0: without far monitor   (it is only provided by custom requirement)

```
┌─────────────────────────────┐  Enter  ┌─────────────────────────────┐
│ Far Monitor      Enter      │────────▶│ Far Monitor                 │
│                             │  Esc    │                  Yes        │
│                             │◀────────│                             │
└─────────────────────────────┘         └─────────────────────────────┘
                                              ▲        │
                                              │        ▼
                                        ┌─────────────────────────────┐
                                        │ Call  No1                   │
                                        │      +86-21-58229333        │
                                        │                             │
                                        └─────────────────────────────┘
                                              ▲        │
                                              │        ▼
                                        ┌─────────────────────────────┐
                                        │ Call  No2                   │
                                        │      +86-21-58222800        │
                                        │                             │
                                        └─────────────────────────────┘
```
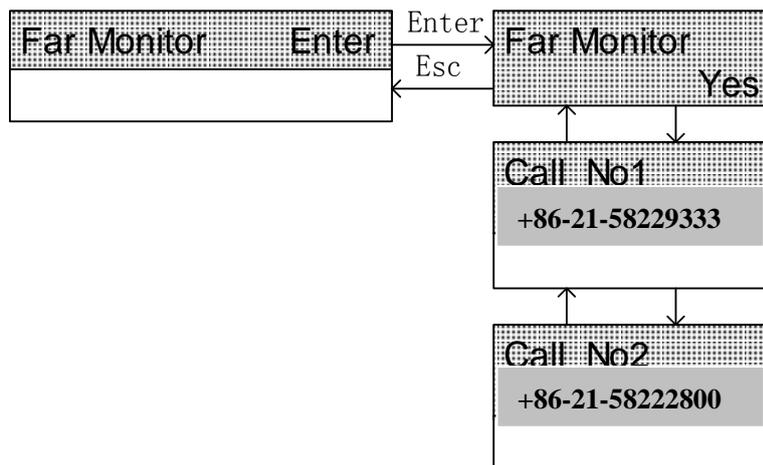
Call number can be set under conditions that far monitor enable. When elevator takes place fault, it will ring the telephone number. There are two number which can call at most.

(6) two door mode

There are two doors at the same floor, elevator work mode can be set by user requirement.
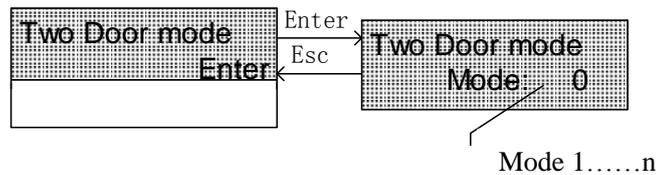
Mode n=0: single door mode.

Mode n=1:two door mode, Only one door acts at every floor. For example, 3 floor/ 3 stops elevator, 1, 3 floor only have front door, 2 floor only has rear floor, in this situation, we should set mode as 1.

Mode n=2: two doors mode, two doors act at some floors. The door open as follow logic,:

-   At going through door floor, at the same time, only one door can open and close, besides that only after door interlock closed, the other door can be opened and closed.
-   At going through door floor, when door closed, door close limit of another door is invalid, the two doors will close at same time.
-   Under inspecation mode, the two doors can open but can not open at same time.

n=3，4： two door mode 3,4, two doors act at some floors (at least one floor landing door is going through). The door open as follow logic: At going through door, except inspection, two doors are closed/opened at same time.

n=5： two door mode 5，two doors act at some floors (at least one floor landing door is going through). The door open as follow logic: At going through door, elevator stop because of inner calling, the two doors will open at same time, otherwise it will only open the calling side door. Open/close button and current floor calling are responded to another side door.

Under two door mode 205, the front door and rear door are responded to different inner calling and landing call. I.E., for N floors/stops elevator, if landing calling (inner calling) of 1-N are responding to 1-N floor front door, then landing call (inner call) of N+1~N+N are responding to 1-N floor rear door. For two door mode 1-5, before floor/stop extension, we need to use multi function extension unit BL2000-EBB as rear door open/close call, door open/close limit, safety edge input, door open/close incstruction responding output, door open/close output use output of Y2, Y3 of main control card.

(7) fire mode

mode 1: only return to homing floor

mode 2: you should assure the outer device meet national standards.
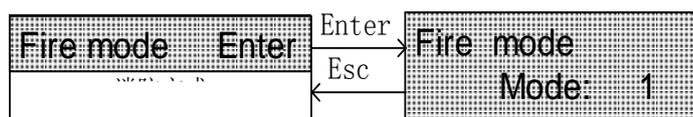
(8) parallel elevator number

Elevator number is A or B, if parallel running enable.

```
Parallel  No  Enter  ──Enter──→  Parallel      No
                     ←──Esc────              A/B
```
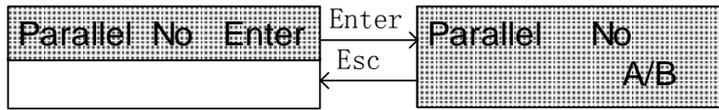
(9) Jog output (optional)

➢ when inverter has jog frequency output function, we can choose such function;
➢ Set "Drive" as "Yes" in jog menu to choose Jog output function, as"No" without jog output
➢ Only during inspection, choosing such function has jog output.

```
Jog Select           ──Enter──→  Jog Select
          Enter       ←──Esc───           Drive:Yes/No
```
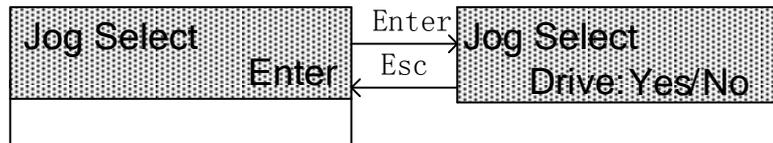
(10)multi-speed mode
When some transducer needs multi-speed given, this parameter is 'Yes', analog given is 'NO'.The default value is YES.

```
Multi Speed Mode     ──Enter──→  Multi Speed Mode
          Enter       ←──Esc───           Yes / ON
```
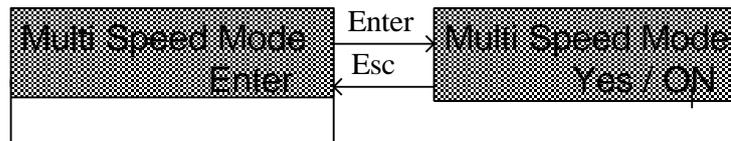
(11)multi-speed set
When multi-speed given is enabled, you must set multi-speed. Refer to table:

3-10

speed value multi speed speed shift distance \ Lift	1.0m/s		1.5~1.75m/s	
	Multi speed (V)	Speed shift distance(S)	Multi speed (V)	Speed shift distance (S)
V1/S1	1m/s	1.3m	1.5~1.75m/s	2.4m
V2/S2	0	0	1.0m/s	1.3m
V3/S3	0	0	0	0
V4/S4	0	0	0	0

Elevator speed

Discounted Motor rev
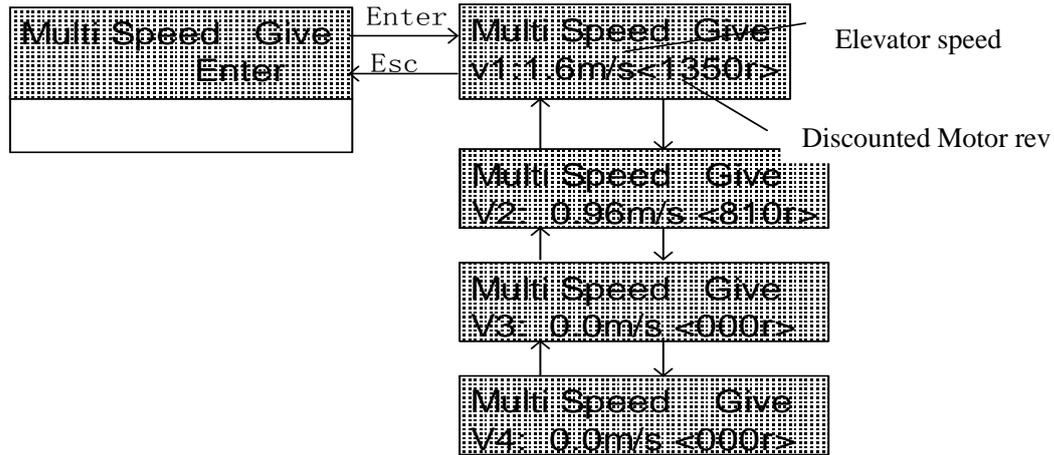
No

value will

ef

    I.E: When elevator speed is 1.0m/s, we only need to set V1 as 1.0m/s, V2-V4 as 0. When elevator is during 1.5m/s ~1.75m/s. V2 should be set below 1.0m/s. Control system will chosse different multi speed according to different target distance.

    3）Speed of inspection、crawl, self-learing are set in multi speed parameter of inverter directly.

    4) Once set the speed, LCD will indicate the motor speed （unit:RPM), we must set the multi speed value in inverter parameter menu according to the motor speed.

    ※ V1~V4 is for system inner calculation, only modify this parameter can not reduce the elevator actual speed.

Multi speed output logic

    Multi speed output instruction is combined by Y13、Y4、Y15, the logic is as below chart:

3-11

port speed	Y15（J6-12）	Y14（J6-11）	Y13（J6-10）
Inspection (no jog)	0	1	0
Self learing	0	0	**1**
crawl	0	1	1
Low speed (V4)	1	0	0
Medium speed 1(V3)	1	0	1
Medium speed 2 (V2)	1	1	0
High speed (V1)	1	1	1

    Note: Set corresponding multi speed of inverter according to above output logic. The appendix II, III list Yaskawa and FUJI inverter typical parameters for reference.

(12) deceleration distance

In multi-speed given mode, in order to avoid braking at non-zero speed and long crawling time, deceleration distance should be adjusted. Deceleration distance is different for different speed, it is determined by test. The data of Chart 3-10 is for reference during value set.

```
┌──────────────┐  Enter   ┌──────────────┐
│Decel Distance│ ───────▶ │Decel Distance│
│        Enter │ ◀─────── │S1:     2.4m  │
│              │   Esc    └──────┬───────┘
└──────────────┘          ┌──────▼───────┐
                          │Decel Distance│
                          │S2:     1.3m  │
                          └──────┬───────┘
                          ┌──────▼───────┐
                          │Decel Distance│
                          │S3:     0m    │
                          └──────┬───────┘
                          ┌──────▼───────┐
                          │Decel Distance│
                          │S4:     0m    │
                          └──────────────┘
```
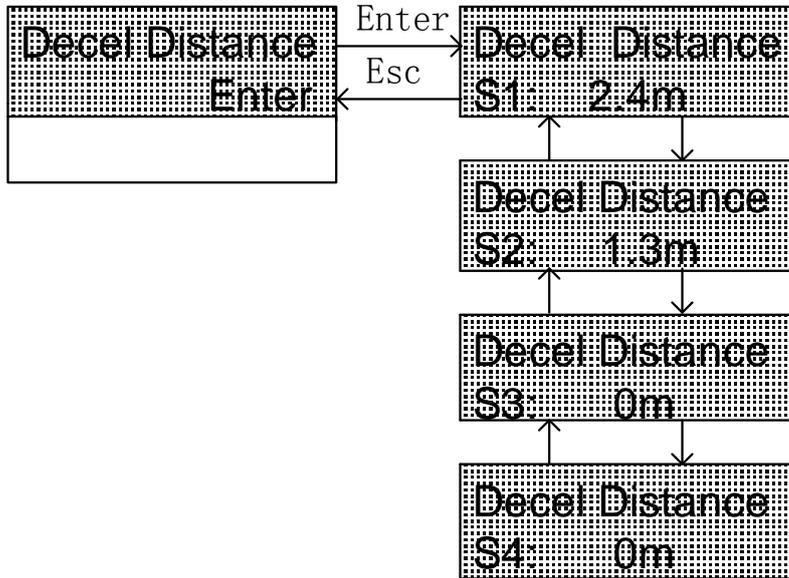
(13)running time over

The time from start to stop should be limited, in order avoid damaging by rope slides or car box blocked. If running time from bottom to top is beyond to this time, system will be stop to protect. It exits protection state, only if system is powered on again. User set it by elevator speed and height of building, the defult value is 45 seconds.

```
┌──────────────┐  Enter   ┌──────────────┐
│ Over  Time   │ ───────▶ │  Over Time   │
│        Enter │ ◀─────── │     045      │
│              │   Esc    └──────────────┘
└──────────────┘
```
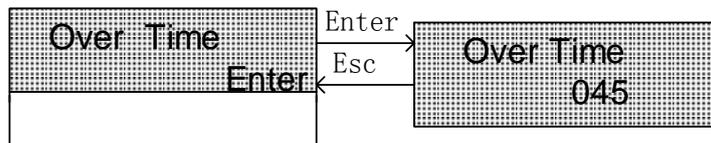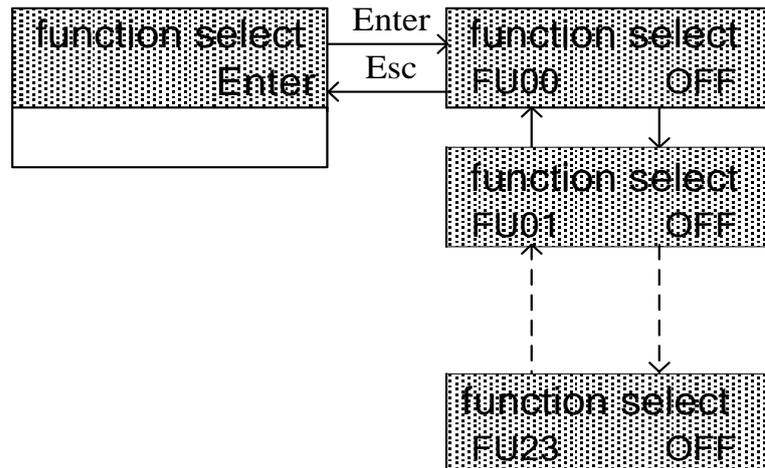
(14) special

3-12   special function chart

Function no.	Note
FU00	After elevator stop and leveling, based on current floor, if above floors do not have any registered landing call and inner Calling, the system will cancel all registered inner calling
FU01	For inner test
FU02	The elevator shift speed to crawl, when meeting with double door zone, the inverter given speed is 0, otherwise the system will consider the given speed is 0 when meeting with single door zone.
FU03	Inner test
FU04~ FU08	Standby
FU09	ON： The inner calling can be cancelled during elevator running.;OFF：the inner calling can not be cancelled during elevator running
FU10	ON：when inverter running feedback (X19) valid, brake immediately; OFF： when inverter running feedback valid, brake after 0.5 second. For SIEI inverter, please set that as OFF
FU11	ON： KEB inverter multi speed logic output.
FU12	ON：able, diretion, multi speed are gived at same time（For iverter of SIEI, KEB multi speed）;OFF：If do not use SIEI and KEB inverter multi speed, please set the value as OFF
FU13	ON：for SIEI multi speed, when elevator stop, firsly direction fall, then zero speed and brake.;OFF：making able, direction fall at same time.
FU22	Using currnet input port of board to implement going through door function （refer to below no. 2 statement）

*FU11、FU12、FU13 can be set as ON ONLY for Inverter of SIEI and KEB. For other inverter, please set that as OFF

KEB inverter multi speed output logic：

port speed	Y15（J7-6）	Y14（J7-5）	Y13（J7-4）
Inspection	1	0	0
Self learing	0	0	1
Crawl	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

1、Set FU12、FU13 as ON, the output time sequence of micro processor board.
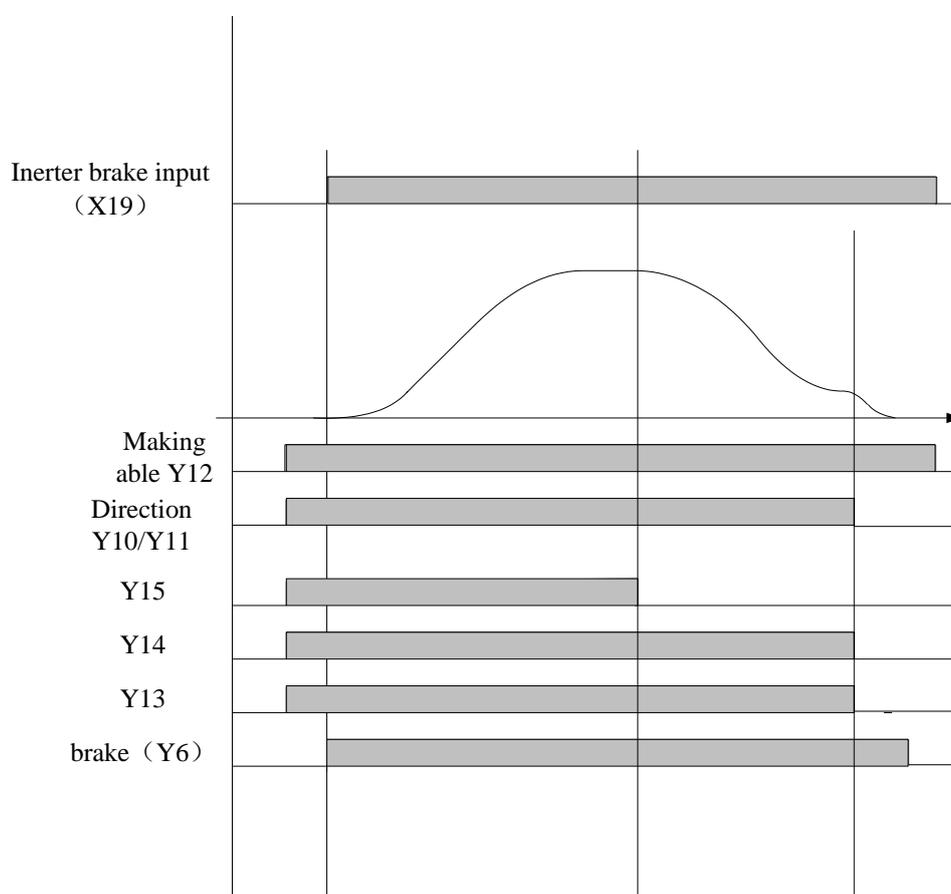
2、Using currnet input port of board to implement going through door function:This function can be used for program version above 404-03

If choosing FU22 as ON, the current input port will be reconsidered as rear door input of going through door. In this way, it isnot necessary to add going through door extension card BL2000-EBB.（when using this function, below re-definition port must not be used by control system, otherwise it must add going through door extension card BL2000-EBB and set FU22 as OFF）

Redefinition of input port as below chart：

FU22 as OFF   FU22 as ON

Terminal no.	Location	Definition	Teminal no.	Location	Definition
X3	J2-4	Top teminal 2 input	X3	J2-4	Door open limit 2 input
X4	J2-5	Bottom terminal 2 input	X4	J2-5	Door close limit 2 input
I7	J4-10	No load input	I7	J4-10	Door open 2 input
I12	J5-5	Door close 1input	I12	J5-5	Door close 1 input * Door close 2 input *
X18	J3-9	Standby input	X18	J3-9	Safety edge 2 input

∗FU25 as ON, the two doors close instruction use the same input and corresponding, door open 2 input no corresponding output.

*FU22 as ON, set function code of X18 as 21 (standby)

  Note：After re-definition of port, the input type setting of C3, X4, X18 can not change normal open/ normal close input. If it is necessary to modify the normal open/normal close input, please set that in U4-U7 (door open/close lmit input setting) and U17-U18 (safe edge input type)

Chapter 4 System Debugging And Running

4.1 check before power on

Electric part must be checked after it is fixed. The fellow should be noticed:

1. Check connect cable refer to manual and electric schematic diagram.
2. Check whether high voltage and low voltage are connected or not. Measure resistor between different voltage circuit.
3. To avoid damage transducer, check the connection between control cabinet power supply and motor
4. check control cabinet shell, motor shell car box ground wire and hall door ground wire are reliably connected to ground.
5. check connection and lay out between coder and transducer . Check degree of concentric between coder and traction motor.
6. elevator stop at middle leveling position
7. electronic lock switch is at 'on' position.

4.2 power on and check

4.2.1 confirm the follow item before power on:

1. all the air switch in control cabinet are open.
2. emerency stop button is pushed down and control cabinet switch is at inspection position
3. car top and car box switch is at normal position
4. landing call box terminal resistor is connected.
5. check power voltage: phase voltage V_p: $3807\pm\%$VAC, V_p error: $V_{pe}<15$VAC; line voltage V_l: $220\pm7\%$VAC

4.2.2 check after power on

1. closing power switch, if phase sequence relay KXX green light on, the phase sequence is right, otherwise, two of wires are exchanged, then repeat this step.
2. check voltage between terminal of TC1 in control cabinet, which error is no more than $\pm7\%$.
3. if above check is normal, you can continue doing the following step:
   a. close F2: voltage between terminal 100 and 100 is $110\pm7\%$VAC
            voltage between terminal 102 and 103 is $110\pm7\%$VAC
   b. close F3: voltage between terminal 200 and 201 is $220\pm7\%$VAC
   switch power voltage table:

Terminal	L-N	5V-G	24V-G
Voltage	$220\pm7\%$VAC	5 ± 0.1VDC	24 ± 0.3VDC

4. reset emergency stop button, KJT and KMC closed, transducer   work.
5. if above check is normal, you can continue doing the following step:
   a. check inter-lock circuit
   b. check leveling zone signal and top/bottom limit signal
   c. check electronic lock: when the parameter of automatic start/stop elevator time is 0, if

lock switch is 'on', 'insp' is displayed on LCD; if lock switch is 'off', 'stop' is displayed on LCD.
d. Check close/open door system.

4.3 parameter set

4.3.1 main control unit parameter set

These parameters are set by local factual requirement. The method refers to chapter 3

Below is the normal parameter need to be set:

1）Total Floor
   ➢ Set by actural floors
   ➢ Floor range：1~12；
   ➢ Under two door mode 2、5, landing call and inner call of front/ rear door should be input individually, floors of N should be calculated as $1 \leq N \leq 12 - f$, N is the max total floors, f is the max absolute floor with going through door.

2）InputType
   Firstly we need to make sure the site shaft switch and door system are " normal open input" or " normal close input",the default value of system are as below chart
   4-2

Input signal	Port no. （location）	parameter （InputType）	default	Note	indicator（valid signal）
To limit	X5（J2-6）	X5	ON	Normal close, disconnection valid	Off
Bottom limit	X6（J2-7）	X6	ON	Normal close, disconnection valid	Off
Top terminal 1	X7（J2-8）	X7	OFF	Normal close, disconnection valid	Off
Bottom terminal 1	X8（J2-9）	X8	OFF	Normal close, disconnection valid	Off
Up leveling	X9（J2-10）	X9	ON	Normal open, close valid	Light
Down leveling	X10（J2-11）	X11	ON	Normal open, close valid	Light
Door open limt 1	I1（J3-4）	U04 – U07	OFF	Normal open, close valid	Light
Door close limit 1	I2（J3-5）				

Door open limit 2	BL2000-EBB				
Door close limit 2	BL2000-EBB				
Safety edge 1	I3（J3-6）	U17 – U18	OFF	Normal open, close valid	off
Safety edge 2	BL2000-EBB				

If outer signal input type is not complied with default value, we only need to reverse the parameter value（ON to OFF or OFF to ON）

    3） OutputType

        Sometime we need to modify the inverter enable control output (Y12). The system defult value is normal open（ON, close valid), if the enable input of inverter is disconnection, valid, we should set output type of Y12 as "OFF"

    4） Door Select

      ➢ If going through door is available, please set the front/rear door ation according to the actual situation.（refer to chapter 3)

      ➢ System consider to open the front door only in default

    5） Car Speed

        According to nameplate of traction machine , or calculated by motor rated speed, traction rato, and diameter of tractionmachine :

$$Ca\,r\ speed = \frac{Motor\ rated\ speed * diameter * 3.14 * deceleration\ ratio}{60*1000* traction\ ratio}$$

    6） Motor Speed

        According to nameplate of motor

    7） Pulses

      ➢ If encoder is connected to micro processor board directly, set the value according to actual pluses of encoder directly;

      ➢ If encoder signal has been diverted, set the value according to the actual pulses to micro processor borad after diverted.

    8） Multi Speed Give

      ➢ For speed ≤ 1m/s, only setting V1 as 1 is enough;

      ➢ For speed ＞1m/s，we need to set V1，V2（V2＜V1）

      ➢ Decel Distance

        Based on the multi speed set in 8), set the Decel distance according to chart 3-10

4.3.2 transducer parameter set

The parameter of transducer must be configured before elevator low speed running. The detail refers to appendix 1. We suggest that motor parameters are set by transducer learn. Which refer to

transducer manual.

4.4 low speed running

4.4.1 machine room inspection running

(1) The following must be confirmed before inspection running:

    a. Control cabinet inspection switch is at inspection position; car top and car box inspection switch is at normal position.

    b. Safe circuit and lock circuit are normal. Coder is normally fixed and connected. Notice: inter-lock mustn't be short.

    c. KJT relay, KMB relay and KMC contactor in control cabinet are close after powering on. Transducer normally displays and inspection parameter are right set. LCD display 'INSP' in work state items

    d. The connection between traction motor and control cabinet is right.

(2) running

    If the condition of inspection running is met and you push down low speed running button (up/down), elevator runs at set speed. You can the speed and direction of feedback displayed in transducer LCD. Elevator up speed is positive; it's down speed is negative.

    a. When push down low speed running (up/down) button, if the feedback speed isn't steady or error is too big, the power of system is powered off, then phase A and phase B of coder are exchanged. The system runs again.

    b. If elevator speed is steady, but the direction of running and button is contrary, two connection wires of transducer and motor are exchanged and phase A and phase B of coder are exchanged too after power off. The system runs again.

    c. If the direction and feedback are right, but system is protected by 'Er04', phase A and phase B of coder on main board are exchanged after power off. Then system runs again.

4.4.2 car top and car box inspection

    When machine room inspection normally runs, elevator may perform car top and car box inspection runs. If the direction of up/down button in car top and car box is contrary to elevator direction, you should inspect corresponding circuit of button and shouldn't change circuit in control cabinet.

4.5 hoistway learning

    Hoistway learn is elevator detects the position of every floor and every switch in hoistway at learning speed. Because the position of floor is the base of elevator's starting and braking and indicator, elevator must perform hoistway learn before normally running. The follow is the step:

a. Elevator meets safe running conditions.

b. The switches in hoistway are right fixed and connected. Traveling cables and landing call cables are right connected. Addresses are right set.

c. Elevator runs to bottom limit at low speed in inspection state.

d. You operate elevator by menu after entering into learn menu. Elevator runs from bottom to top at inspection speed. 'Learning' is displayed on LCD. 'Success' is displayed on LCD after elevator runs to top limit and stops.

Hoistway learn is finished. The result of learning may be checked in monitor menu. Unit is m. if system takes place fault in the learning course, it will abort and display fault code (refer to appendix 5)

Notice: It is success if 'success' is displayed on LCD after it finishes learning.

4.6 high speed running

Elevator may run at high speed after it successes in learning.
a. Elevator runs in attendant state.
b. You may select floors by monitor menu, it may run in single floor mode, double floor mode, multi-floor mode and all floor mode.
c. It is confirmed that starting, acceleration, deceleration and leveling are all normal.
d. If it is abnormal, you should check main unit parameter and transducer parameter.

4.7 adjust elevator more comfortable

If leveling precision is bad and passenger don't feel comfortable, first you should check mechanical system (e.g. clearance and lubricate of track, degree of tightness of rope and position of plywood etc.). Then you may adjust control part if mechanical system is good.

Because transducer runs by given starting and braking curves, the curves shape, tracking error and time sequence of logic all have effect on it.

4.7.1 Elevator running curves

Figure 4-1 is running curves.
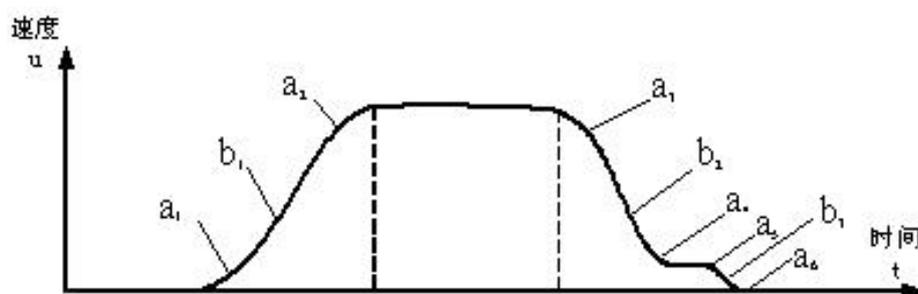
4-1 running curve

Start up step S curve is adjusted by below three paramters

a1：beginning start-u step acceleration: curves acceleration variation ratio It is smaller and elevator is more smooth.

b1：start-up step acceleration: curves speed variation ratio .It is smaller and elevator runs more smooth.

a2：end start-up step acceleration: curves acceleration variation ratio .It is smaller and elevator runs more smooth.

Braeing step S curve is adjusted by below three parameters

a3：begin braking step deceleration: curves deceleration variation ratio It is smaller and elevator is more smooth.

b2：braking step acceleration: curves deceleration variation ratio It is smaller and elevator is more smooth.

a4：end braking step deceleration: curves deceleration variation ratio .It is smaller and elevator runs more smooth.

a5：begin crawling step deceleration

b3：crawl step acceleration

a6：end crawl step deceleration

Note：When commissioning the elevator in site, we can suitable adjust above parameters to meet for the best elevator running curve.The curve will be produced by inverter. Parameter of a1~a6. b1~b3 are inner paramters of inverter. The parameter code here is definited by us. The correct parameter code, please kindly refer to the inverter manual book.

4.7.2 adjustment of curves track

If motor feedback speed must track speed curves given well, elevator will run in smooth. Transducer establishes math model of motor by input motor parameter, by which it controls motor, so user must input right motor parameters (we suggest motor parameter learn.).

Speed loop proportion gain C5-01 (Yaskawa inverter) and integral gain C5-02 (Yaskawa inverter) both affect tracking error. Increasing proportion gain may improve dynamic characteristic, but it may cause high frequency vibration and increase motor noise if proportion gain is too big; increasing integral gain may improve resist disturb ability, tracking ability and precision of leveling, but it may cause vibration.

Generally, we adjust proportion gain at first, then we adjust integral gain.

4.7.3 adjustment of elevator running control time sequence

Figure 4-1 is time sequence. Microcomputer unit program run by figure 4-1.User may adjust the time of releasing time and zero speed.

Releasing time t_1: t_1 is the delay time of output release brake command and start-up cures. This parameter adapts to traction motor acting time, which affects elevator smooth start. If it is too big, elevator will brake at start time; if it is too small, elevator will be slide at start time.

Zero speed set: zero speed threshold Microcomputer judges braking time by it. If it is too big, elevator will brake at moving time, if it is too small, open door will delay. Default value is 5rpm.

4.8 leveling precision adjustment

Precision of leveling is adjusted after 4.7.1 has been finished. If you want to exact level, leveling zone sensor and shelter board are exactly fixed. When car locate at leveling position, the

center of shelter board is middle of two leveling zone sensor. If using the magnet sensitive switch, the inserting depth of shelter board muse be deep enough.to avoide high up leveling and low down leveling. Bedore elevator stop, the elevator must have a short time crawling. The fellow is adjustment step:

1. Stopping position

It is assured that the stopping position up running and down running is same by adjustment of curves select, proportion gain and integral gain.

2. Adjustment of shelter board
   a. When elevator stops at every floor, you should measure and record the value ($\triangle$ s) of subtract the height of door sill from the height of car box sill. ($\triangle$ s >0, car box sill is higher than door sill; $\triangle$ s <0, car box sill is lower than door sill)
   b. Adjust shelter board every floor $\triangle$ s>0: shelter board is moved up; $\triangle$ s<0: shelter board is moved down.
   c. Hoistway learn must be perform again after shelter board is adjusted.
   d. Leveling is checked again, if precision of leveling isn't eligible, do a-c again.

3. If elevator stop at the same position, but up leveling and down leveling isn't same, it may be adjusted by leveling adjusting menu, the default value is 50mm. If up leveling is high and down leveling is low, it is reduce; if up leveling is low and down leveling is high, it is increased, the value is $\triangle$ s/2. If $\triangle$ s is 20mm, adjust value is 10mm.

   Please note below phenomenons which are usually happed during elevator commissioning:
   (1). No crawling or too long time crawing
·If no crawling, that is to say the Decel distance too short or deceleration curve too smooth.
·If crawing time is too long, that is to say the deceleration distance is too long or deceleration curve too sharp.
   (2).Low up leveling, high down leveling or high up leveling, low down leveling
   When elevator stops, it happens low up leveling, high down leveling, that is to say crawling speed is too low. When elevator stops, it happens high up leveling, low down leveling, that is to say the crawling speed is too high. In such situation, we need to adjust crawling speed.
   (3). Low up leveling, low down leveling or high up leveling, high down leveling
   When elevator stops, it happens low up leveling, low down leveling or high up leveling, high down leveling, that is to say the installation of door zone shelter board is not correct. Please adjust the door zone shelter board intallation postion.

Note：based time sequence, choose single door zone to stop (set FU02 as OFF), we can get the running effection closing to " direct stop" , but the leveling precision is hard to adjust. Choose double door zone to stop, (FU02 as "ON"), the crawing time is slightly long but the leveling is accurate. Please refer to appendix I

4.9 terminal switch position confirming

   Terminal signal is forcing change speed and floor position revising signal. Which is fixed at the position that the distance is 2.5m (1.6m/s) from car box to leveling position.
Inspection speed is 0.3m/s and elevator runs in inspection state. It runs up (down), when it arrives at terminal it stops. The distance is 2.5m±0.1m from car box sill to door sill.

Appendix I Multi Speed Running Time Sequence

① inspection（no jog）
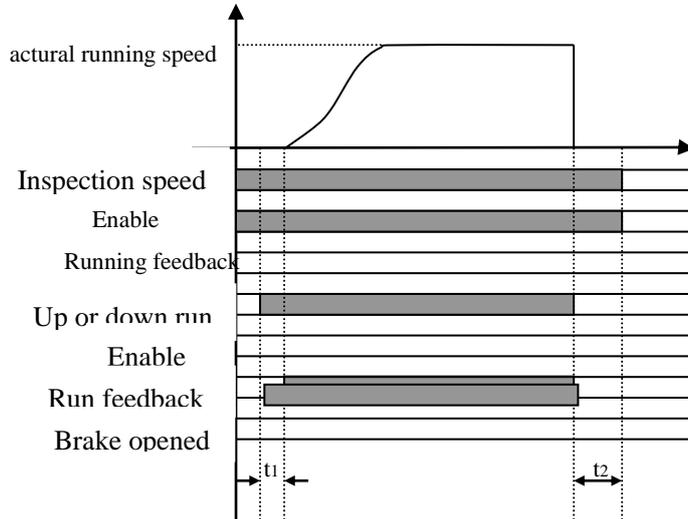
t1:brake opened time ahead of schedule　t2:holding time after the elevator stopping（not be set）。

② inspection（jog，for example YASKAWA inverter）
the mode "Drive" being 1 is the mode which has jog output and decreased time switching output. Inspection speed is only controlled by Y1.
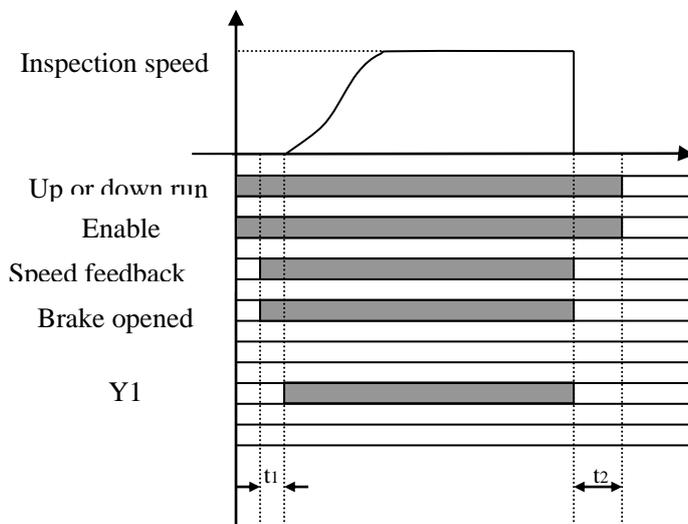
③ hoistway learn or leveling

Door entrance
(entering top landing under hoistway learn)

Double door entrance
(entering up limit under hoistway learn)
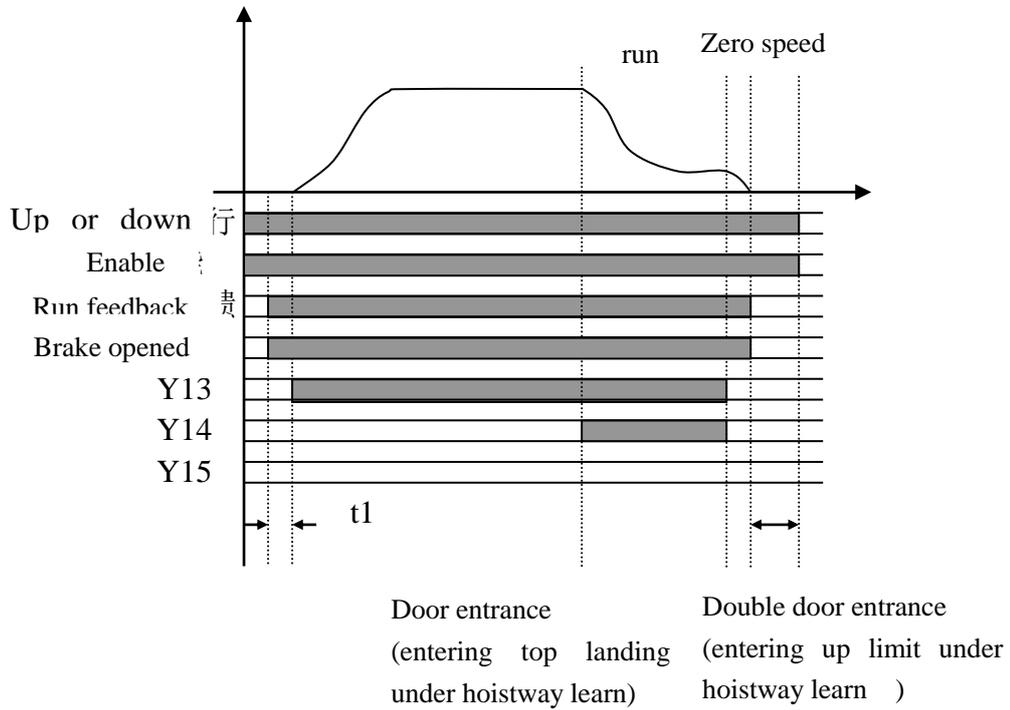
> Self-learing running curve is same with crawling curve.;
> During self learing, entering into overhead sinle door zone, self learing speed reduce to crawling speed, bumping with top limit, the speed reduce to zero;
> Crawling and level running, enter into single door zone, self learing speed reduce to crawling speed, entering into double door zones, speed reduce to zero;
> Only the actural speed of motor below zero, the MCU will send braking instruction.

④ protecting auto returning (the position of door entrance range is the bottom door entrance zone the same to leveling)

⑤ high speed
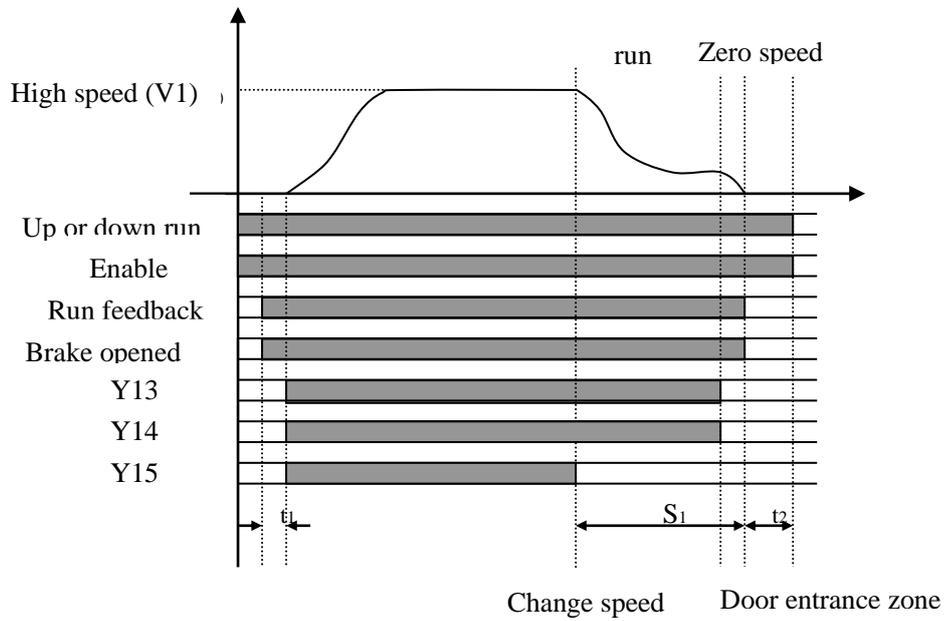
S1 is the changed speed distance under high speed run.

> When elevator runs at high speed, at the speed shifting point, V1 is reduced to crawling speed, entering into single door zone (FU02=OFF, if FU02=ON, entering into double door zone), the gived speed is reduced to zero.

> Genral speaking, only actural speed of motor below zero, the MCU will give braking instruction. But if elevator shift speed to stop and enter into double door zone, the system failed to check the zero speed signal within 5 seconds, the MCU also will give braking instruction.

⑥ Middle speed
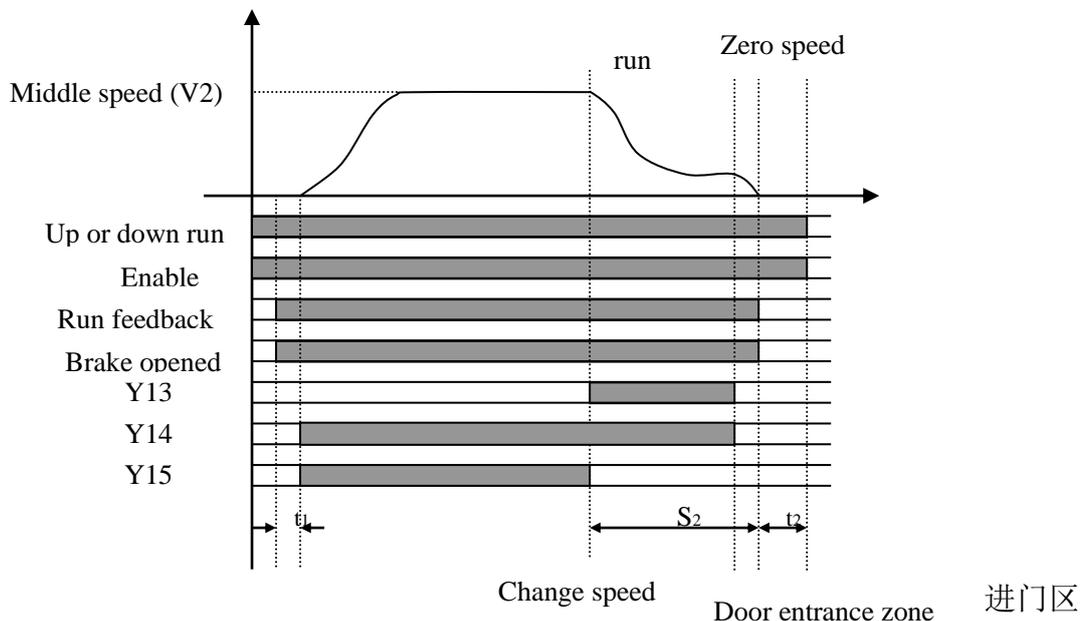
S2 is the changed speed distance under middle speed 2.

- ➤ If the running distance is very small, after starting   the elevator will choose the middle speed (V2) automatically to run.
- ➤ The elevator runs to speed shifting points at medium speed, the gived speed V2 is reduced to crawling speed, after entering into door zone (FU02=OFF, single door zone, FU02=on, double door zone), the speed will be reduced to zero.
- ➤ Genral speaking, only actural speed of motor below zero, the MCU will give braking instruction. But if elevator shift speed to stop and enter into double door zone, the system failed to check the zero speed signal within 5 seconds, the MCU also will give braking instruction

Appendix Ⅱ Malfunction Code and Narrative

The following table is only for refer to.

No.	code	note	process
1	Er1		
2	Er2	door Inter-lock fault circuit open	Check door inter-lock circuit and door knife
3	Er3	Transducer fault	Check transducer fault code
4	Er4	Elevator direction is contrary to instruct: a. main control unit A,B pulse reverse, b. elevator direction inverse	a. exchange A and B b. change motor phase sequence
5	Er5	It doesn't monitor feedback signal after output release signal	Check switch and connect wire. If there isn't switch, brake feedback disable
6	Er6	Leveling zone signal doesn't open	Check leveling zone signal and induce switch
7	Er7	Input into main unit No. of coder pulse is too small	Check pulse input circuit and connect
8	Er8		
9	Er9	Output KDY acting instruction is different to feedback	Check KDY output, feedback circuit and KDY contactor
10	Er10	Emergency stop circuit open	Check emergency stop circuit
11	Er11	Elevator doesn't detect leveling zone signal	Check leveling zone signal and induce switch
12	Er12	Over top limit	Check coder and connect
13	Er13	Over bottom limit	Check coder and connect
14	Er14	Floor counter error.	Elevator returns to bottom floor and revise position. Check coder, leveling zone circuit and connect. Type fault: leveling zone switch tingle or rope slide
15	Er15		
16	Er16		
17	Er17	Main control unit output instruction, but it doesn't receive transducer running signal	Check transducer direction, enable, and running circuit. Check parameters set.

18	Er18	Floor counter error.	Elevator returns to bottom floor and revise position. Check coder, leveling zone circuit and connect. Type fault: leveling zone switch tingle or rope slide
19	Er19	Decel distance too short	Adjust the Decel distance according to the V1~V4 value
20	Er20	Terminal overpeed protection. The feedback speed dose not reduce together with gived speed	Check the inverter parameters and inverter
21	Er21	Running time over setting time	Check rope slide or car box block. Check over time setting.
22	Er22	Inspection signal input at High running	Check inspection switch and circuit
23	Er23	One of two leveling zone is invalid	Check leveling zone signal and induce switch
24	Er24		
25	Er25	Termperatur sensing protection, brake resistance and motor overheated	
26	Er26	door inter-lock contactor state is different to coil	Check coil and contactor state Check main board input port
27	Er27	Emergence stop contactor state is different to coil	Check coil and contactor state Check main board input port
	U	Door open malfunction, door open limit valid and door open time over, but the door interlock is connected	Check door open output relay,door open limit and door interlock loop or whether door interlock is shortly connected.
	N	Door open malfunction, door open limit valid and door open time over, but the door interlock is disonnected	Check door open output relay, door open limit and door interlock loop
	O	Door close malfunction, system will open the door, and close again. If repeated that 5 times, and door interlock still is disconnected. Then the system will not close the door and give this fault code.	Same as above.

Appendix III Shaft Self-learing Fault Code

The following table is only for refer to.

No.	code	note	process
1	LER=0	System running protection	Strike 'esc', check fault record
2	LER=1	Pulse input phase reverse	Exchange A phase and B phase
3	LER=2	Bottom terminal 1 input repeat	Bottom terminal 1 fixed in error or tingle
4	LER=3	Bottom terminal 1 lost (>2m/s)	Arrive at bottom Terminal 2 before bottom terminal 1 or bottom terminal 1 lost
5	LER=4	Bottom terminal 2 input repeat (>2m/s)	Bottom terminal 2 fixed in error or tingle
6	LER=5	Bottom terminal 2 lost (>2m/s)	Arrive at top Terminal 2 before bottom terminal 2 or bottom terminal 2 lost
7	LER=6	Top terminal 2 input repeat (>2m/s)	Top terminal 2 fixed in error or tingle
8	LER=7		
9	LER=8	Top terminal 2 lost (>2m/s)	Arrive at top Terminal 1 before top terminal 2 or top terminal 2 lost
10	LER=9	Bottom terminal 1 lost	Arrive at bottom Terminal 2 before bottom terminal 1 or bottom terminal 1 lost
11	LER=10	Top terminal 1 input repeat	top terminal 1 fixed in error or tingle
12	LER=11	Top terminal 1 lost	Arrive at top limit before top terminal 1 or top terminal 1 lost
13	LER=12	Learn No. of total floors error	Check total floor set and shelter board fix
14	LER=14	Two leveling zone switch without overlap	Shelter board can't shield two switch, or lost one switch
15	LER=15	Strike 'esc' cancel it	Strike 'esc' key
16	LER=17	Leveling zone 1 and 2 input at the same time	The wire is connected together
17	LER=18	Save data in error	Contact with us
18	LER=19	Arrival at top limit, two leveling zone signal input	Top limit is fixed too low It is move down
19	LER=20	Bottom limit is fixed too high	It is moved up

Appendix Ⅳ Asynchronism Motor Controlling Cabinet

Yaskawa Inverter 616G5、676GL5-JJ Parameter

1. Key

'Menu' key: display menu

'Esc' key: exit menu

'＞' key: select bit

'∧', '∨' key: select menu and modify value

data/enter key: confirm

2. set

The following table is only for refer to.

No.	parameter	name	value	note
1	A1-02	Control mode select	3	PG vector control
2	A1-00	Language select	0	
3	A1-01	Parameter access level	4	
4	B1-01	Speed instruction select	1	
5	B1-02	Running instruction select	1	
6	B1-03	Stop method select	1	
7	B1-04	Reverse forbid select	0	
8	B2-01	Zero speed logic level	0.1	
9	B2-03	Start DC control time	0	
10	B2-04	Stop DC control time	1	
11	C1-01	Acceleration time 1	0.1	
12	C1-02	Deceleration time 1	0.1	
13	C1-03	Acceleration time 2	2	
14	C1-04	Deceleration time 2	2	
15	C2-01	begin Acceleration characteristic time	0	
16	C2-02	End Acceleration characteristic time	0	
17	C2-03	begin deceleration characteristic time	0	
18	C2-04	end deceleration characteristic time	0	
19	C5-01	ASR proportion gain 1	10	
20	C5-02	ASR integral gain 1	0.35	
21	D1-09	Push run instruction	200	
22	E1-01	Transducer input voltage	380	
23	E1-02	Motor select	0	
24	E1-04	Max output frequency	50	
25	E1-05	Max voltage	380	
26	E1-06	Base frequency	50	
27	E1-09	Min output frequency	0	
28	E2-01	Motor rated current	*	nameplate
29	E2-02	Motor rated voltage	*	Nameplate

30	E2-03	Motor empty load current	*	Rated current 35-40%
31	E2-04	Motor polar	*	Nameplate
32	F1-01	PG constant	*	By coder
33	F1-02	PG open action	1	
34	F1-03	Speed over action	0	
35	F1-04	Speed error too large action	0	
36	F1-06	Divide frequency ratio	1	
37	F1-08	Speed over standard	105	
38	F1-09	Speed over delay time	1	
39	F1-10	Speed error too large standard	30	
40	F1-11	Speed error too large delay time	1	
41	H1-03	Terminal 5 function select	F	Not used
42	H1-05	Terminal 7 function select	6	Push run
43	H1-06	Terminal 8 function select	9	
44	H2-01	Terminal 9 function select	37	
45	H2-02	Terminal 25 function select	37	
46	H3-01	Terminal 13 logic level select	0	
47	H3-02	Terminal 13 input gain	*	By analog voltage and elevator speed set
48	H3-03	Terminal 13 input error	0	
49	H3-04	Terminal 16 logic level select	1	
50	H3-05	Terminal function select	14	
51	H3-06	Terminal 16 input gain	0	
52	H3-07	Terminal 16 input error	0	
53	L3-04	Drop speed function of deceleration select	0	
54	L5-01	Reset times	5	
55	L8-05	Input low voltage protect	1	
56	L8-07	Output low voltage protect	1	
57	O1-01	Monitor select	5	
58	O1-02	Monitor power on select	1	
59	O1-03	Speed instruction unit	*	Motor polar
60	O1-04	Frequency instruction unit	0	

Appendix Ⅴ Asynchronism Motor Controlling Cabinet

Yaskawa inverter G7A Parameter

Parameter	Name	Default	Remark
A1-00	LCD display language	0	English
A1-01	Parameter store and read grade	2	ADVANCED
A1-02	Control mode select	3	With PG vector control
B1-01	Frequence select	1	Control circuit terminal (simulating input)
B1-02	Running instruction select	1	Control circuit terminal (in sequence control input)
B1-03	Stop method select	1	Free speed reducing
B1-04	Reverse forbid select	0	Reversible
B2-01	Zero speed logic level	0.1	
B2-03	Start DC braking time	0	Invalid
B2-04	Stop DC braking time	1	
C1-01	Acceleration time 1	2.5	
C1-02	Deceleration time 1	2.5	
C1-03	Acceleration time 2	2.5	
C1-04	Deceleration time 2	8.0	
C2-01	begin Acceleration characteristic time	0.7	
C2-02	End Acceleration characteristic time	0.5	
C2-03	begin deceleration characteristic time	0.7	
C2-04	end deceleration characteristic time	0.7	
C5-01	ASR proportion gain 1	10	
C5-02	ASR integral gain 1	0.35	
D1-02	Frequency instruction 2	200	"multi speed instruction 1" as ON
D1-03	Frequency instruction 3		"multi speed instruction 2" as ON
D1-04	Frequency instruction 4	100	"multi speed instruction 1,2 " as ON
D1-08	Frequency instruction 8	1425	"multi speed instruction 1,2,3 " as ON
D1-17	Job frequency instruction	200	"job frequence seletc", "FJOG instruction" as ON
E1-01	Input voltage	380	
E1-02	Motor select	0	Standard motor
E1-04	Max output frequency	50	
E1-05	Max voltage	380	
E1-06	FA	50	
E1-09	FMIN	0	
E2-01	Motor rated current	current	
E2-02	Motor rated slip		Unit: HZ, automatically set during self learning
E2-03	Motor no load current		Unit: A automatically set during self learning

E2-04	Motor pole	Pole	automatically set during self learning
E2-11	Motor rated power	Power	Unit: 0.01KW automatically set during self learning
F1-01	PG parameter	PG	
F1-02	PGO	1	Free slip and stop
F1-03	Overspeed select action	0	Deceleration to stop（according to C1-02 ）
F1-04	DEV action select	0	Deceleration to stop（according to C1-02 ）
F1-06	PG output diverting ratio	1	PG output diverting ratio =（1+n）/m, n=0,1　m=1～32
F1-08	Overspeed checking value	105	
F1-10	DEV	30	
F1-11	DEV checking time	1	
H1-03	Terminal S5 function select	3	Multi function point input 3
H1-04	Terminal S6 function select6	4	Multi function point input 4
H1-05	Terminal S7 function select	5	Multi function point input 5
H1-06	Terminal S8 function select	F	Multi function point input 6
H1-07	Terminal S9 function select	F	Multi function point input 7
H1-08	Terminal S10 function select	7	Multi function point input 8
H1-09	Terminal S11 function select	6	Multi function point input 9
H1-10	Terminal S12 function select	9	Multi function point input 10
H2-01	Terminal M1~M2 function select (meeting point)	37	Multi function point output
L3-04	Anti speed losing during deceleratioin select	0	Invalid
L5-01	Reset time	5	。
L8-05	Input low voltage protect	1	Valid
L8-07	Output low voltage protect	1	Valid
O1-01	Monitor item select	5	
O1-03	Frequency instruction set/display unit	pole	

Appendix Ⅵ   Asychronism motor control cabinet G11UD inverter parameter

No.	parameter	name	value	note
1	F01	Frequency set1	1	
2	F02	Running instruction select	1	
3	F03	Output max frequency 1	50Hz	
4	F04	Base frequency 1	50Hz	
5	F05	Rated voltage	380V	
6	F06	Max voltage	380V	
7	F07	Acceleration time 1	0.01s	
8	F08	Deceleration time 1	0.01s	
9	F15	Frequency up limit	50Hz	
10	F16	Frequency down limit	0Hz	
11	F17	Analog input proportion frequency	*	Set by analog max voltage and elevator speed
12	F18	Analog set frequency offset	0	
13	F23	Start frequency	0.4Hz	
14	F24	Start frequency holding time	0.3s	
15	F25	Stop frequency	0.1Hz	
16	F26	Switch frequency	15Hz	
17	F27	Start timber	0	
18	F36	30Ry action mode	0	
19	F40	Torque limit 1 (electro motion)	200	
20	F41	Torque limit 1 (brake)	200	
21	E01	X1 terminal function select	0	
22	E02	X2terminal function select	1	
23	E03	X3 terminal function select	2	
24	E04	X4 terminal function select	3	
25	E05	X5 terminal function select	4	
26	E09	X9 terminal function select	7	
27	E10	Acceleration time 2	0.01s	
28	E11	Deceleration time 2	0.01s	
29	E12	Acceleration time 3	0.01s	
30	E13	Deceleration time 3	0.01s	
31	E14	Acceleration time 4	0.01s	
32	E20	Y1 terminal function select	7	
33	E21	Y2 terminal function select	34	
34	E22	Y3 terminal function select	37	
35	E23	Y4 terminal function select	1	
36	E25	Y5 action mode	0	
37	E33	Over load action select	1	

38	E34	Over load action value	P06*0.5	
39	E35	Over load action time	0.2s	
40	E46	Language set	1	
41	C05	Multi-speed 1	0	Terminal crawling speed
42	C06	Multi-speed 2	0	Inspection speed
43	C07	Multi-speed 3	0	Crawling speed
44	C10	Multi-speed 6	0	Moderate speed
45	C11	Multi-speed 7	0	High speed
46	P01	Motor polar	*	By nameplate
47	P02	Motor power	*	By nameplate
48	P03	Motor rated current	*	By nameplate
49	P06	Motor empty current	*	By default
50	P09	Motor rated slide frequency	note	
51	H11	Deceleration mode	1	
52	O01	Speed instruction mode	1	
53	O02	Speed instruction filter constant	0.020	
54	O03	No. of Coder pulse	*	By actual
55	O04	ASR P constant	20	
56	O05	ASR L constant	0.1	
57	O06	Speed feedback filter constant	0.003	
58	O07	ASR P constant switch frequency 1	5	
59	O08	ASR P constant switch frequency 2	10	
60	O09	ASR P constant	20	
61	O10	Multi-speed instruction time	0.005s	
62	O13	S curves set 1	0	Begin acceleration
63	O16	S curves set 4	0	Moderate acceleration end
64	O17	S curves set 5	0	Moderate deceleration end
65	O18	S curves set 6	0	High acceleration end
66	O19	S curves set 7	0	High deceleration end
67	O20	S curves set 8	0	End deceleration
68	O21	S curves set 9	0	
69	O22	S curves set 10	0	
70	O37	Torque instruction filter constant	0.0	
71	O38	Start time	0.3	
72	C31	Analog input offset adjust	0	
73	C32	Offset adjust	0	
74	C33	Analog input filter	0.5	

Appendix Ⅶ   Additional function adding Narrative

（2005-4-25）

1．According to new elevator standard, change the brake test as below：

Set Brake Feedback as Yes, change the input function code 15 （KMC feedback input）of X15 to 23（brake feedback 2，brake traveling switch）, the defult value of protection time(brake feedback 2 test time) is 2 seconds, malfunction code is 05. (X17 function unchanged，testing time 200ms)

2．Add ARD function

ARD running must meet for below requirement:

1）Power failure, ARD supply power. （ARD input of X18 valild）;

2）Elevator is not in inspection status

3）Elevator is not in door zone

4）Elevator can run normally

5）Electric lock loop is Ok

Elevato ARD run course for elevator is not in door zone：

1）The elevator decide the running direction automatically according to the load ; full load, down emergency running, otherwise up emergency runninig

2）Elevator stop at the closest floor and open the door, and keep the door open. After certain time, the ARD will cut off the power supply ;

3）When the normal power is available again, if according to the system record, the elevator automatically level by ARD , the elevator will go to parking floor and have a scale emendation

If the elevator is in door zone, ARD will supply the power （ARD input of X18 valid）, elevator open the door automatically

3．Add malfunction code ER28：bottom terminal 1 or top terminal 1 conglutination fault.下

4．Add self learing fault code LER21：top terminal（ or speed above 2m/s top second terminal） conglutination

5．Add self learning fault code LER22：bottom terminal （or speed above 2m/s bottom second terminal ）conglutination

6. In previous factory running parameter add below parameters：

（17）brake feedback 2 checking time

Brake feedback 2（brake traveling switch） conglutination proection checking time。

Break Check Time 2000ms

（18）Beep delay time

```
Beep delay time
500ms
```

（19）automatically lamp off time

```
Lamp off time
15min
```

（20）brake feeback protection time

ER=05 brale feedback protection time, if the number has reached 5, it is necessary to turn off the power and restore the value.

```
Break err timer
5
```

（21）YCC protection timer

ER=09 YCC protection time，if the number has reached 5, it is necessary to turn off the power and restore the value.

```
YCC err timer
5
```

（22）anti mischief inner calling times

```
Select order Max
3
```

(23) add zerp speed time

```
Zero Time
300ms
```