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Chapter 1 Introduction of the Functions of BL2000 Serial Control System

1.1. List of Basic Functions

No	Description	Usage	Instruction of elevator action	Remarks
1	Automatic running		(1) Arrival open door; (2) Delay close door; (3) Manual pre-opening(door opens when the delay open time is not reached)； (4) Internal selecting automatic register(elimination of wrong operation); (5) Call directional car stop; (6) Call opposite highest (lowest) car stop.	（1）Turn the normal/inspection switch of cabinet to the normal position; （2）Position the automatic/attendant switch to the automatic position ; （3）The other two normal/inspection switches are on the normal positions.
2	Attendant running		（1）Arrival open door; （2）Manual close door; （3）Internal selecting automatic register (elimination of wrong operation); （4）Call directional car stop.	（4）Turn the normal/inspection switch of cabinet to the normal position; （5）Position the automatic/attendant switch to the attendant position ; （1）The other two normal/inspection switches are on the normal positions.
3	Inspection running	Used in debugging, maintenance and inspection	After the system is set to be in maintenance state, if the slow running up or slow running down, the elevator will run upward and downward with the maintenance speed and it will stop when the button is released.	Normal/inspection switch is respectively positioned on the car top, in the car or on the control cabinet. The preference is from the top to the bottom.
4	Automatically open door after power on	Automatic door opening	In normal condition, when the system is powered on, if the car is in the landing, the door will open automatically	
5	Automatically close door delay	Maintaining door in opening	After the door is opened, the state will be kept and the door will be closed automatically after delay time.	（1）Set the delay time by the door opening holding time parameter(T); （2）When in call stopping, T－2 seconds will be delayed;

				(3) When elevator stops for both car call and landing call, delay time is **T+2 second.**
6	Open door for current floor landing call	call open door	When door is closing or closed but elevator doesn't start, door will be opened automatically again.	Delay time is set by the set open door holding time.
7	Safe board or photoelectric board protection	Safely close door	If safety door edges is touched or photoelectric board is sheltered, door close action stops at once and door will be opened automatically.	After safe board or photoelectric board action is sheltered, door will close again.
8	Overload without closing door	Waiting for load decreasing	If elevator is overloaded, door is opened, overload light is turned on, buzzer sounds, 'CZ' is displayed on COP and the elevator can not start.	It restores normally after overload is cleared up.
9	Full load lay a course	Elevator responds to car call of the nearest floor	Elevator responds to car call and not to landing call when it is full load.	It restores normally after overload is clear up.
10	Pass with attendant control.	VIP running	In attendant state, elevator responds to car call if non-stop button is pushed down, the elevator will only respond to the selection inside instead of the call outside.	
11	Running state display	Maintenance and debugging	Elevator state, direction, floor, door state, load and fault information may be displayed on LCD on the main board in cabinet.	
No	**Description**	**Usage**	**Instruction of elevator action**	**Remarks**
12	Automatically control light	Energy saving	Car light is turned off after 15 minutes if the elevator isn't being used. It will be turned on after receiving any call.	

13	Fire		When fire switch is closed, system enters into fire state: (1) It clears up all calls; (2) It will return to fire floor open door. (3) Hold-open door; (4) When it arrives at fire floor, it outputs fire signal. (5) If elevator direction is opposite, it stops at nearest floor without open door and returns to fire floor and holds the door open.	There are two kinds of fire mode for user to choose: a. Mode 1: elevator returns to fire floor and stops service. b. Mode 0: (a) Landing call is invalid. (b) Door is opened at fire floor. (c) When elevator is need to start service, fireman pushes down car call button and presses close door button until door closed. If close door button is released before door closed, door is opened at once. (d) 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. (e) One destination floor can be set every running.
14	**Automatically stop for fault**	Saving passenger	When elevator doesn't stop at landing for fault during the running with a high speed, it should be automatically creeping to landing and open door.	Only when safe circuit and inverter are both normal.
15	Parking	In parking state	When electronic lock is closed, elevator enters into landing state: 1. Elevator doesn't respond to landing call. If there is car call, it finishes all car call service and returns to parking floor (set). 2. If there is no car call, it returns to parking floor directly. 3. After it arrives at parking floor: (1) Landing call box and COP display 'ZT'. (2) The elevator can not respond to any call. (3) Door is automatically closed, light	(1) If the elevator is in inspection state when electronic lock is closed, elevator can't return to parking floor, the other functions are the same. (2) CPU is always in parking state when elevator keeps in parking state and as soon as electronic lock is opened, the elevator will not be in the parking state.

			is turned off and the display is extinguished after 10 seconds. (4) Pressing any car call button or close/open door button, light is turned on. (5) Pressing close/open door button; Door will be automatically closed and light will be turned off again after 10s.	
No	**Name**	**Usage**	**Instruction of elevator action**	**Remark**
16	Parallel control	Preferable parallel control	(1) When there is landing call, two elevators respond to it at one time. One of them finishes the service by the rule of speediness and economy from their position and direction, therefore, elevator efficiency is improved. (2) When two elevators both haven't service, one returns to homing floor (usually the 1st floor), another one stands by.	When parallel connection of two elevators is connected by supplied cables and parallel connection parameters are set correctly, parallel running can be realized.
17	Group control running	Multi-elevator optimized control	BL2000 can control 8 elevators simultaneously	

1.2. Special Functions

No	Description	Usage	Instruction of elevator action	Remarks
1	Hoistway self-learning	Measure and save the hoistway data	In maintenance state, from the lower limit switch to the upper limit switch, the control system can get and save the date on the position of landing and hoistway switch forever.	In the self-learning, if abnormal condition occurs, the learning will stop and error signal will be output. For the error list, please see the appendix 5; ▲Note: When the self-learning is stopped, only if the word "Success" displays on the LED, the self-learning can be thought to be completed.
2	**Cancel mistake operating**	Cancel car call	Pressing the car call button again, it can be canceled (the light for car call turns off).	It can be achieved when the elevator is not running.

3	Anti-nuisance	Cancel car call at terminal	1. When elevator arrives at farthest floor and changes direction, it clears all car call registers. 2. If it has load detection device, when it is light load, the number of car call is 3 at most.	
4	Landing call button inset diagnose	Maintenance indication	When landing call button is pressing for over 20s, this button is thought to be inserted (can not be reset) and the landing can not be registered. The corresponding light twinkles to alarm.	When the button is released, the system restore normally.
5	Repeat close door		After performing the close door command, if door inter-lock circuit doesn't put through, elevator opens door and closes it again.	If the action repeats 5 times, door inter-lock circuit still doesn't put through, system stops service and display fault code.
6	Floor selection by machine room	Debugging	Complete the car call register by operating the buttons on the LED in the cabinet.	
7	Machine room door open/close	Debugging	Input the open/close door commends by operating the buttons on the LED in the cabinet.	
No	**Description**	**Usage**	**Instruction of elevator action**	**Remarks**
8	Non-stop floor set	Set the floor not to stop at	The elevator does not stop at the set floor.	
9	Homing floor set	Waiting at homing floor	In automation state, if there is no car call or landing call in a certain time, elevator returns to homing floor automatically.	Homing floor can only set to one floor.
10	Random setting of the floor displaying character	Change one (some) floor displaying content	Floor displaying character may be set by the buttons on LCD in the cabinet, which can be letter or figure.	
11	Attendant selecting direction	VIP running	In attendant state, attendant has preference to choose running direction by up/down button.	In attendant state
12	Timing automatic start/stop service	Automatically start/stop service	The system can execute the start/stop (homing) service time by practical setting time.	1 Time is set by 24 hours. 2 The function can be canceled if both the start and stop times are set to be 00. 3. Electric lock preference: This

				function is valid when electronic lock is switched on, if it is switched off, elevator works at parking state. 4. If you want elevator to exit from automatic stop service, you may perform the following operation: (1) Switch electronic lock from on to off for 1s, then switch it on again, the system will enter the enforced running state and the elevator can run normally. (2) After that, switch electronic lock from on to off for 1s, then switch it on again, the system will exit the enforced running state and elevator will enter into automatically stop service state.
13	Special running	Services for special passenger	The landing call is invalid in this state. The elevator is controlled by the attendant. Door control mode is the same as attendant mode.	When special switch is equipped
14	Prolong the close door time	Prolong the close door time	During the door opening to the automatic door closing, if the button is pressed, the holding time of the opening will be prolonged to be the set prolonging time.	（1）The elevator is equipped with prolonging closing delay time button. （2）It can be used in the automatic running state. （3）It is usually used in hospital elevator.
15	**Rear opening control**	Elevator with 2 doors	It can control the opening and closing of two doors act at corresponding floor.	For the definition of the rear opening, please refer to the relative chapters of this manual.
16	Fault diagnosis	Automatically searching and recording the error information	(1) When elevator is error, the system diagnoses the fault and display fault information on LED. (2) The time, type and floor of the latest 10 faults will be stored in fault report for maintenance personnel to check.	For the error codes, please refer to relative appendix.
No	**Description**	**Usage**	**Instruction of elevator action**	**Remarks**
17	Interference	Automatically	It can evaluate the ground	This function is used after finishing

	evaluation	measure the interference on site to the main board	connecting condition (restraining interference source) of the control cabinet and the ground connection of hoistway (reliable shied); in addition, It conducts maintenance personnel to remove hidden trouble and provides more safe and reliable circumstance.	debugging.
18	**Encoder evaluation**	Automatically inspect the quality of the encoder output pulse	It analyzes and evaluates the encoder pulse signal to avoid the error caused by the encoder and conducts maintenance personnel to remove the trouble on tingling and leveling.	The judgment of the quality of encoder and the interference condition.
19	**Evaluation of the interference on input port**	Automatically inspect the influence of the input signal interfered by hoistway	The system can evaluate the input signal and displays it by on LCD; in addition, it can conduct the personnel to reasonably and properly complete the wiring and ground connection, so as to eliminate the faults on the floor number displaying and leveling caused by the interferences of the trailing cable and hoistway parallel connected with the main board to the input of the main board.	**The direct display of electric level interference of the input circuit**
20	Automatic rescue running	When power off, the automatic rescue device will supply the power for leveling	After power off, the automatic rescue device (ARD) will supply the power for the leveling of the elevator and the escaping of the passenger: The automatic rescue running should meet the following requirements: 1、 When power off, the automatic rescue device will supply the power (the automatic rescue running input X18 of the main board is valid); 2、 The elevator is not in maintenance state; 3、 The elevator is not in landing; 4、 There is no running fault; 5、 The door lock circuit signal	Because the ARD is used in the automatic rescue running, and the drawing of control cabinet in the system is different from the standard drawing, so please contact our technical office for the reference drawing; if the SYT-YY automatic rescue device manufactured by our company is used, please see the appendix 3: specification of the SYT-YY automatic rescue device.

			is normal; The running process of the automatic resue device when the elevator is not in the leveling zone: 1、 Determining the running direction according to the load condition; 2、 The elevator runs to the possible nearest floor and keeps the open state; after a certain time, the ARD cut off the power supply; 3、 The power supply of the elevator restores; the elevator returns to the bottom floor to correct the calibration. When the elevator is in the landing, the ARD supplies the power (the automatic rescue running input X18 of the main board is valid) and the door opens automatically.	

No	Description	Usage	Instruction of elevator action	Remarks
21	The functions of the elevator for the disabled	Use the operating panel and landing call for the disabled	1. Enable the functions by setting parameters; 2. Operating panel for the disabled: the car call instruction and the open/close input buttons.; 3. Landing call board: by the board, the landing call of the disabled and the normal landing call can be distinguished; 4. The working principle: when leveling, if there is the car call or landing call of the disabled, the open holding time will be prolonged (the open delay time can be set); if the open button on the operating panel of the disabled is pressed, the open holding	（**1**） Setting of landing call board address ◆ When the main board use the functions for the disabled (function choice FU14=ON), the setting of the landing call board should follow the following: ◇ **1 ～ 32** is the absolute floor address corresponding to the general landing call: 1 is the ground floor, 2 is the second floor and the total 32 floors can be set at most; ◇ **33～64** are the absolute floor addresses of the landing call for the disabled: 33 is the bottom floor, 34 is the second bottom floor, and total 32 floors can be set with the top floor is the floor 64; ◇ If only one landing call can be used for one floor, the corresponding address of another landing call will be vacant. ◆ The connections of the car call buttons: ◇ When the functions for the disabled are used by the main board, the connections of the car call buttons for the **1～N** floor are normally connected to the car call ports of the **1～N** floor

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

			3. The speed should be lower than the re-leveling protection speed; 4. The low speed output of the inverter is valid; 5. Safety circuit board outputs are valid;	

1.3. List of Safety Protection Functions

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

1.4. List of selectable functions

No.	Description	Instruction
1	Remote control	The running of the elevator can be real-time monitored in monitor center by wire or wireless communication module.
2	Arrival gong	Arrival gong indication
3	Voice synthesizer	Voice indication
4	ID identify	ID/IC card controlling
5	Hoisting machine	The system can be equipped with synchronous or asynchronous motor as well as geared or gearless hoisting machine.

Chapter 2 Types of BL2000 Serial Control System Computer Boards

2.1. Designation of product models

1. Basic regulation

<u>BL2000</u>—<u>□□□</u>—<u>V□</u>

VERSION No.: product version upgrade, represented by: V + number ".

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

SERIAL No.

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

（1）Main board :	BL2000-STB-Vn
（2）Car board	BL2000-CZB-Vn
（3）Car expansion board	BL2000-CEB-Vn
（4）Group control board	BL2000-QKB-Vn

（5）For other types, please refer to table of computer board types of 2.2.

3. Designation of elevator call and display boards

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

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

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

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

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

The second code means version upgrade, represented by numbers.

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

2.2. Table of computer board types

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

Chapter 3 Combination and components of BL2000 serial control system

3.1. Schematic diagram of system composition

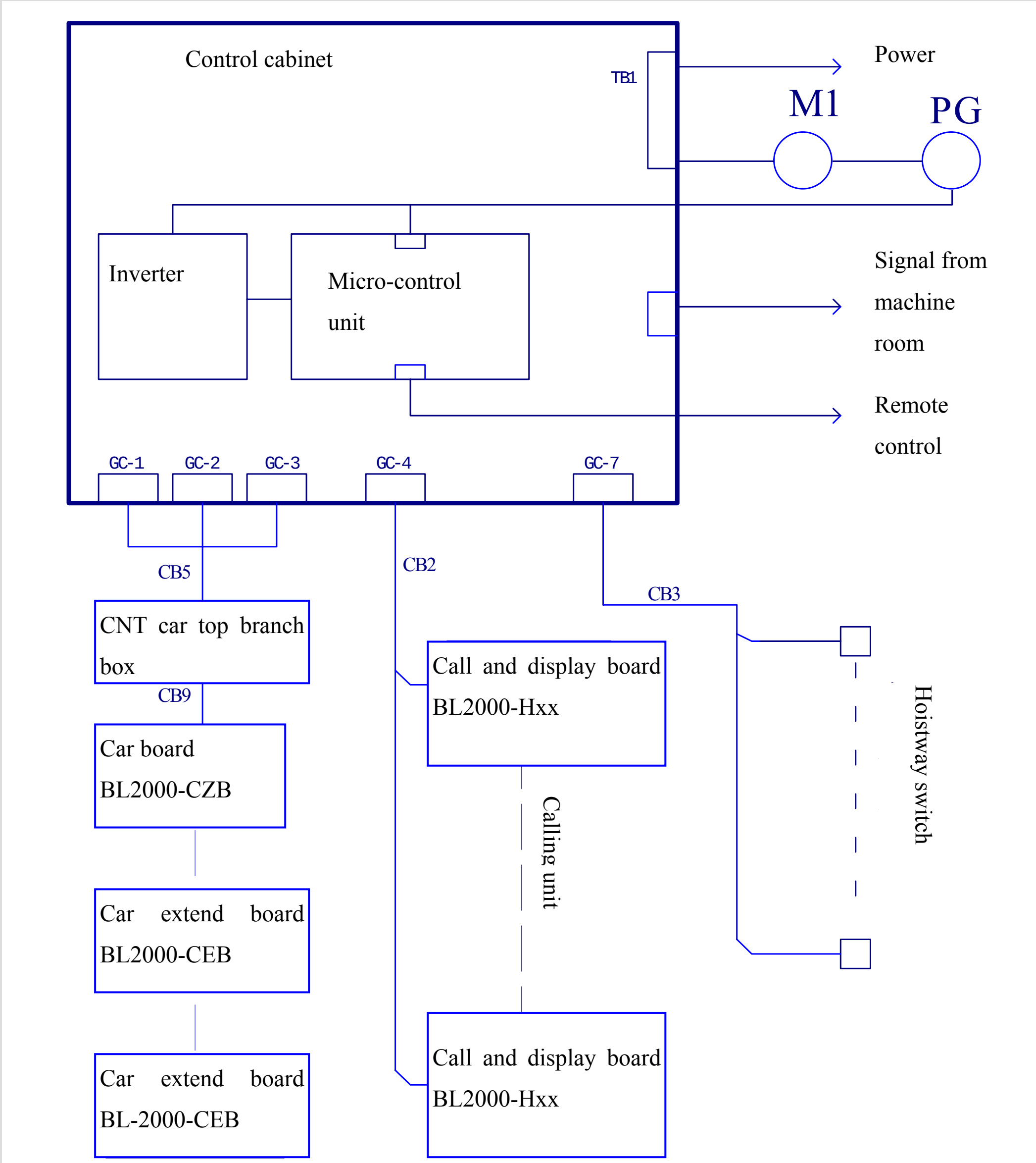


Diagram 3-1: Schematic diagram of BL-2000 serial control System composition

3.2. Performance of the main parts of the system

The **main parts of the system** related in the manual means the boards composing of BL2000 serial control system, which consists of: main board, car board, car expansion board, call and display board, group control board, group control call and display board, voice synthesizer and load inspection device. The serial products of control cabinet with BL2000 serial control system and the other components in BL2000 serial control system are not contained.

3.2.1 Description of features:

3.2.1.1. Fujitsu industrial control single chip computer;
3.2.1.2. Four-layer plate binding process with CAN bus serial communications;
3.2.1.3. High intelligence, strong resistance to interference, and high reliability;
3.2.1.4. Keyboard operation and liquid crystal display;
3.2.1.5. Specialty of elevator operating curve and the leveling precision ≤ 3mm when landing directly;
3.2.1.6. Support parallel connection, group control, monitoring and intelligent management;
3.2.1.7 Provided with RS-485 communication interface (which can be connected with weight inspecting device made by Blue Light to improve elevator startup)；
3.2.1.8 Use portable computer to connect with RS232 interface, being able to choose velocity of elevator in car to comfort passenger.

3.2.2. Scope of application:

3.2.2.1. Elevator selective-collective operation, two elevators parallel connection and group control of 3-8 elevators;
3.2.2.2. Range of speed: 0.5-4m/s;
3.2.2.3. Applicable story: below 64 floors.
3.2.2.4. Passenger elevator, freight elevator, ward elevator and residential elevator；
3.2.2.5. With weighting inspecting compensation and fire control linked interface;
3.2.2.6. Support wired video monitoring, remote monitoring and wireless remote monitor；
3.2.2.7. Applicable to gear towing machine and gearless permanent magnetic towing machine.

3.2.3. Standards for reference

3.2.3.1. Elevator Manufacture and Installation Regulation (GB7588-2003)
3.2.3.2. SJT Serial BL2000 Elevator Control System (Q1SL.J02.01-2003)

3.2.4. Power supply specification

Voltage: DC24V ±1.2V； current: 2A；
Voltage : DC5V ±0.1V； current: 1 A.

▲Note: Increase the power capacity when the building is more than 20 stories. For each story, the increasing value should be ≧100mA.

3.2.5. Working temperature

Working temperature of devices: －40ºC ~ ＋80ºC (except LCD)

3.2.6. Inspection standards

3.2.6.1. Inspecting according to GB/T17626.2-1998 Electromagnetic Compatibility- Testing and Measuring Techniques-Static discharging interference test to make sure the requirements are met (contact discharging: 8kV; test grade: 4).

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

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

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

3.3. Introduction of system main parts with classification

3.3.1. Main board BL2000-STB

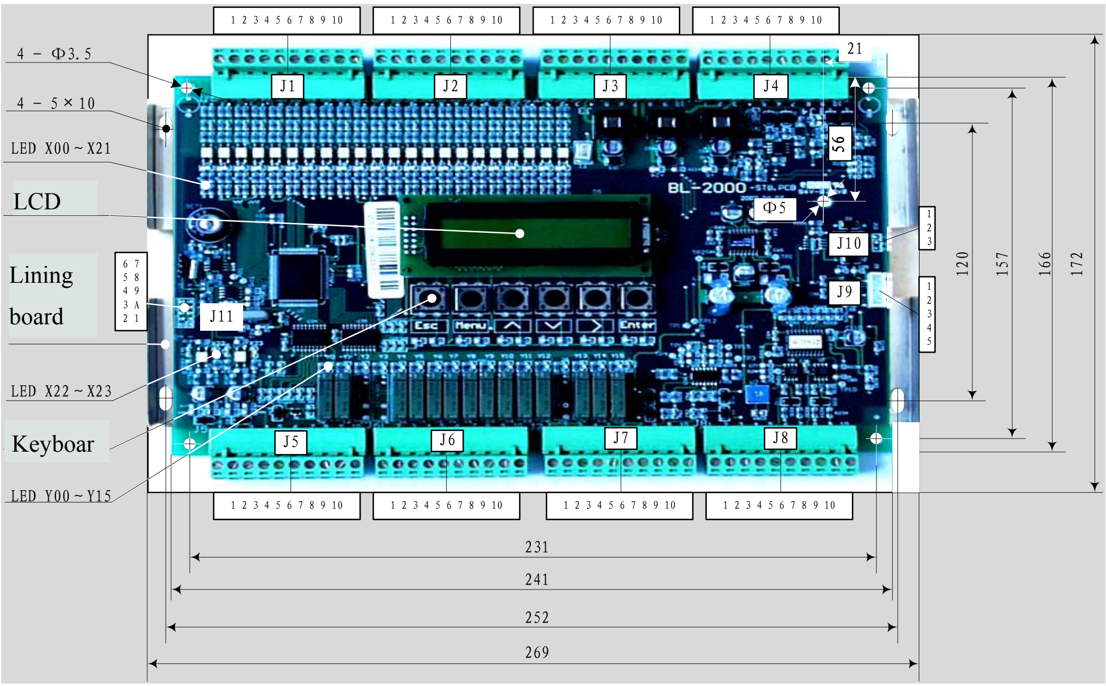


Diagram 3-3-1-1 Appearance and layout installation dimension of main board BL2000-STB

1. Plug specifications

(**1**) rated voltage of J1~J8 multi-wire dip socket DK5EHDRC-10P: 300V, rated current: 15A, voltage resistance: 4KV, pitch: 5mm

(**2**) J9 single-row pin 2.54/5P

（3）J10single-row pin 2.54/3P

（4）J11 double-row connector 2.54/10P

2．Port circuit

Please refer to:

Diagram 3-3-1-2

Diagram 3-3-1-3

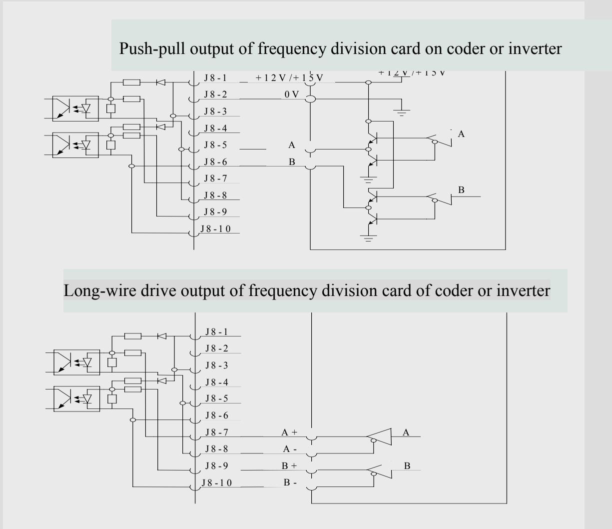


Diagram 3-3-1-2 Main board BL2000-STB pulse input port

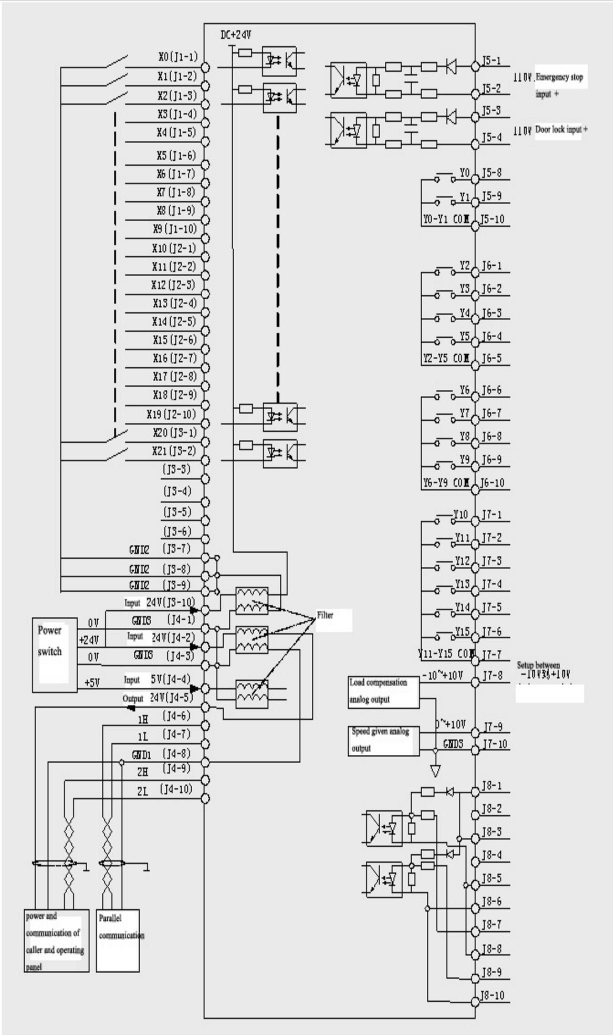


Diagram 3-3-1-3 Main board BL-2000-STB port circuit

3. Definition and specification of ports

Table 3-3-1 Definition and specification of main board BL2000-STB

Name	Port No.	Location	Definition	Usage	Technical specifications of ports			
					Port form	Rated load	Off /on time	Max. speed
J1	X0	J1-1	Inspection input	Input	Optical coupler	DC24V 7mA	10mS	100Hz
	X1	J1-2	Up running input					
	X2	J1-3	Down running input					
	X3	J1-4	Top terminal 2 input					
	X4	J1-5	Bottom terminal 2 input					
	X5	J1-6	Top limit input					
	X6	J1-7	Bottom limit input					
	X7	J1-8	Top terminal 1 input					
	X8	J1-9	Bottom terminal 1 input					
	X9	J1-10	Up leveling input					

Continue Table 3-3-1-

Name	Port No.	Location	Definition	Usage	Technical specifications of ports			
					Port form	Rated load	off/on time	Max. speed
J2	X10	J2-1	Bottom leveling input	Input	Optical coupler	DC24V 7mA	10mS	100Hz
	X11	J2-2	Transducer failure input					
	X12	J2-3	Fire input					
	X13	J2-4	Emergency stop input					
	X14	J2-5	*door interlock input					
	X15	J2-6	*braking feedback input/main power contactor input					
	X16	J2-7	Running contactor input					
	X17	J2-8	Braking contactor feedback input					
	X18	J2-9	Automatic rescue running input					
	X19	J2-10	Transducer running input					
J3	X20	J3-1	Electronic lock input	Input	Optical coupler	DC24V 7mA	10mS	100Hz
	X21	J3-2	Thermal switch input					
	X26	J3-3	Re-leveling input			Only V9 board		
	X27	J3-4	Re-leveling sensor signal input					
	X28	J3-5	Multi-function input					
	X29	J3-6	Multi-function input					
	GND2	J3-7	24V ground		0V			
	GND2	J3-8						
	GND2	J3-9						
	24V2	J3-10	24V X0～X21common		Power	DC24V147 mA		
J4	GND3	J4-1	0V	Power and communication port				
	24VIN	J4-2	24V input		Power	DC24V10A		
	GND3	J4-3	0V					
	5VIN	J4-4	5V input		Power	DC5V500mA		
	24VOUT	J4-5	24V output		Power	DC24V10A		
	1H	J4-6	parallel /group communication wire TXA+		CAN	80mA		25kH
	1L	J4-7	parallel /group communication wire TXA-					
	GND1	J4-8	0V					
	2H	J4-9	Call /car communication wire TXA+		CAN	80mA		25kH

	2L	J4-10	Call /car communication wire TXA-					
J5	X22	J5-1	Emergency stop input+	Input	Optical coupler	AC110V8mA		
	X23	J5-2	Emergency stop input-					
	X24	J5-3	*door interlock input+					
	X25	J5-4	*door interlock input-					
	Y16	J5-5	Standby					
	Y17	J5-6						
	COM0	J5-7	Y16 Y17common	Output	Reply	DC5A24V AC5A250V	5/10mS	20cpm
	Y0	J5-8	Re-leveling control output					
	Y1	J5-9	Fire output					
	COM1	J5-10	Y0～Y1common					

Continue table 3-3-1-

Name	**Port No.**	**Location**	**Definition**	**Usage**	**Technical specifications of ports**			
					Port form	**Rated load**	**Off/on time**	**Max. speed**
J6	Y2	J6-1	Open door 2 control output	Output	Reply	DC5A24V AC5A250V	5/10mS	20cpm
	Y3	J6-2	Close door 2 control output					
	Y4	J6-3	Open door 1control output					
	Y5	J6-4	Close door 1contactor control output					
	COM2	J6-5	Y2～Y5common					
	Y6	J6-6	Braking control output					
	Y7	J6-7	Braking economical resistor control output					
	Y8	J6-8	Main inverter control output					
	Y9	J6-9	Running inverter control output					
	COM3	J6-10	Y6～Y9common					
J7	Y10	J7-1	Inverter up control output	Output	Reply	DC5A24V AC5A250V	5/10mS	20cpm
	Y11	J7-2	Inverter down control output					
	Y12	J7-3	Transducer enable output					
	Y13	J7-4	multi-segment given X1 control output					
	Y14	J7-5	multi-segment given X2 control output					
	Y15	J7-6	multi-segment givenX3 control output					
	COM4	J7-7	Y10～Y15common					
	VB	J7-8	Load offset analog voltage output			-10V～+10V		

	VS	J7-9	Analog speed given voltage output			0～10V		
	GND3	J7-10	Analog output 0V					
J8	15VB	J8-1	15V input	Coder input	High-Speed Optical coupler	12～15V		
	0VB	J8-2	0V					
	5VB	J8-3	5V input					
		J8-4	Void					
	A	J8-5	A phase pulse (push-pull output)			0V/12～15V 18mA		25kH
	B	J8-6	B phase pulse (push-pull output)					
	A+	J8-7	A+ phase pulse (drive)			0～15V 40mA		
	A-	J8-8	A- phase pulse (drive)					
	B+	J8-9	B+ phase pulse (drive)					
	B-	J8-10	B-phase pulse (drive)					
J9	TX2	J9-1	Telecommuting wire TX	RS232 Inspecting communication				
	RX2	J9-2	Telecommuting wire RX					
	IN	J9-3	Telecommuting control wire					
	OUT	J9-4	Telecommuting control wire					
	0V	J9-5	Telecommuting wire 0V					
J10	DA+	J10-1	V DA+	RS485 Communicated with inverter				
	DA-	J10-2	Telecommuting wire DA-					
	0V	J10-3	Telecommuting wire 0V					

- X15 input: when braking feedback inspection enable is set on “Yes”, X15is defined to be brake feedback input; when it is set on “NO”, X15 is defined to be main power contactor input.
- Hall and car door respective inspection function

Inspect hall door circuit reply contact with high-voltage input X24 (J5-3) and X25 (J5-4); inspect car door circuit reply contact with X14 (J2-5); meanwhile, modify the drawing of door circuit reply contact needed to be serial or parallel connected to inspect hall and car doors circuit respectively. (For detailed drawings, please contact the technical office of our company.)

3.3.2. Car board BL2000-CZB

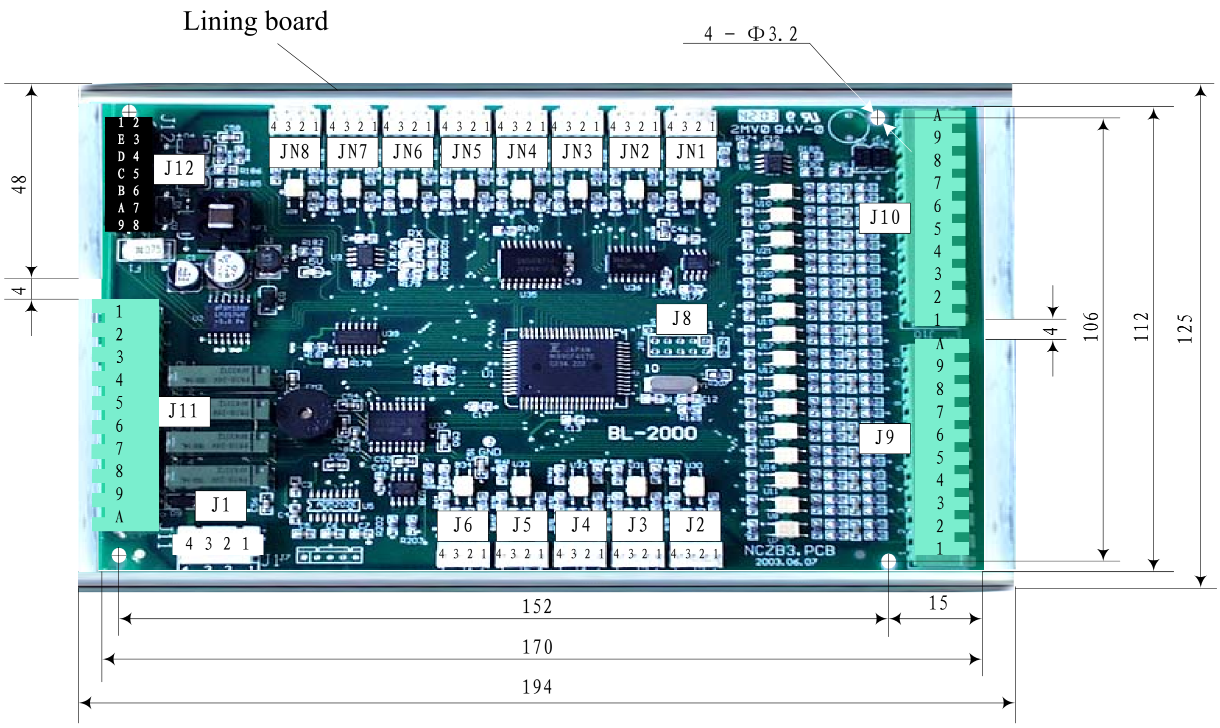


Diagram 3-3-2-1 Appearance and layout installation dimension of car board BL2000-CZB

1． Instruction

(1)Internal selecting and response

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

（1） Car internal display

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

2. Connector specification (BL2000-CZB-V1/V2)

（1） J1 single-row socket 3.96/4P

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

（3） J7 single-row socket 2.54/5P

（4） J8 double-row hole 2.54/10P

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

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

（6） J12 double-row socket 2.54/14P

3 **Port circuit**

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

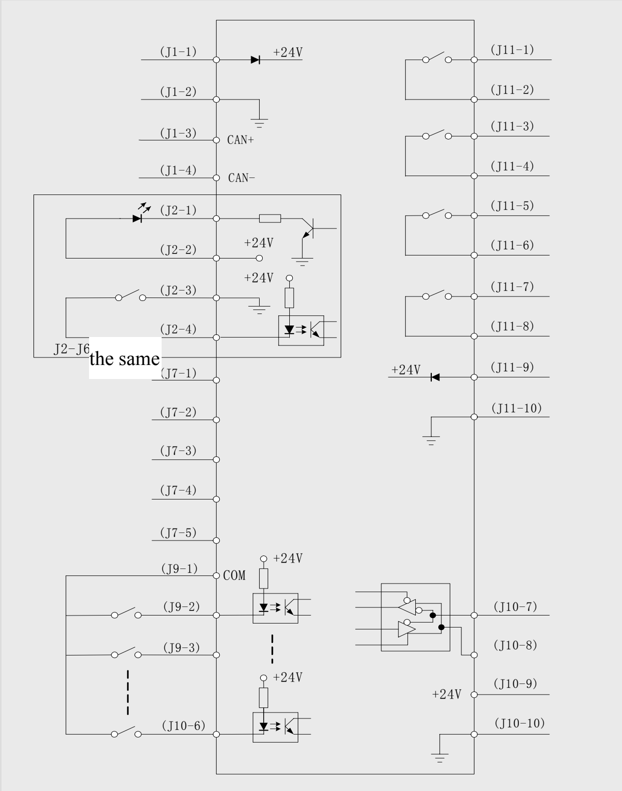


Diagram 3-3-2-2 Port circuit of car board BL-2000-CZB

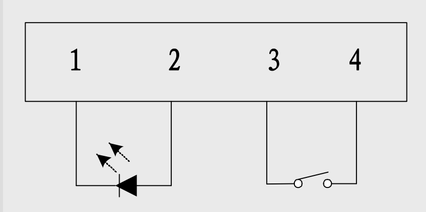


Diagram 3-3-2-3 Wiring diagram of car call button

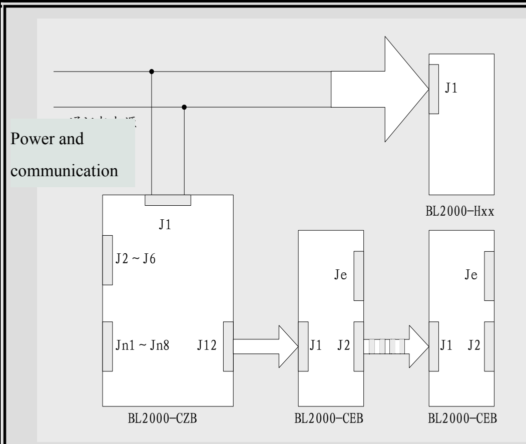


Diagram 3-3-2-4 Wiring diagram of car board and car expansion board

4 definition and specification of port

Table 3-3-2- Definition and specification of port on car board BL2000-CZB

Name	Port	Location	Definition	Function	Technical specification of port		
					Port form	Rated load	Max. speed
J1		J1-1	24V input	Power and communication port			
		J1-2	24V input ground				
		J1-3	CAN bus H				
		J1-4	CAN bus L				
J2		J2-1	Open door button1 response	Open door button 1 and response	OC door	Current limit resistor 560Ω	
		J2-2	24V output				
		J2-3	24V output ground				
		J2-4	Open door button1input		Optical coupler	8mA	
J3		J3-1	Close door button1 response	Close door button 1 and response	OC door	Current limit resistor 560Ω	
		J3-2	24V output				
		J3-3	24V ground output				
		J3-4	Close door button1 input		Optical coupler	8mA	
J4		J4-1	Open door button 2 response	Open door button	OC door	Current	

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

Continue Table 3-3-2

Name	Port	Location	Definition	Usage	Technical specification of port		
					Port form	Rated load	Max. speed
J6		J6-1	Open door delay button response	Open door delay Button and response (selective)	OC door	Current limit resistor 560Ω	
		J6-2	24V output				
		J6-3	24V output ground				
		J6-4	Open door delay button input		Optical coupler	8mA	
J7		J7-1	RS232 receiving	RS232 communication	RS232 Electrical level		
		J7-2	RS232 transmitting				
		J7-3	Signal ground				
		J7-4	RS232 output control				
		J7-5	RS232 input control				
J8	Programming port						
J9	CMM	J9-1	Common	Input	Optical coupler	8mA	500Hz
	KMV1	J9-2	Open door limit input				
	GMV1	J9-3	Close door limit input				
	KAB1	J9-4	Safety contactor 1 input				
	CZ	J9-5	Overload input				
	MZ	J9-6	Full load input				
	KAB2	J9-7	Safety contactor 2 input				
	QZ	J9-8	Light load input				
	KZ	J9-9	Idling input				
	SZH	J9-10	Attendant input				
J10	SZY	J10-1	Specific input	Input	Optical coupler	8mA	500Hz
	SZS	J10-2	Passby input				
	ZHS	J10-3	Attendant running up				
	ZHX	J10-4	Attendant running down				
	KMV2	J10-5	Open door limit 2 input				
	GMV2	J10-6	Close door limit 2 input				

	RT-	J10-7	Serial load inspection communication RT-	SJT-150 serial input	RS485		
	RT+	J10-8	Serial load inspection communication RT+				
	24V	J10-9	+24V				
	CMM	J10-10	0V				
J11	BLV-	J11-1	Arrival gong 1A	Output	Reply	DC5A24V AC5A250 V	20cpm Off/on time ≦ 5/10mS
	BLV+	J11-2	Arrival gong 1B				
	N1	J11-3	Lighting control A				
	ZM	J11-4	Lighting control B				
	BK1	J11-5	Standby 1 A				
	BK2	J11-6	Standby 1 B				
	CZD	J11-7	Overload indicator light A				
	CMM	J11-8	Overload indicator light B				
	24V	J11-9	Auxiliary power +24V input terminal	Input			
	0V	J11-10	Auxiliary power 0V input terminal				

Continue Table 3-3-2

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

3.3.3. Car expansion board BL2000-CEB

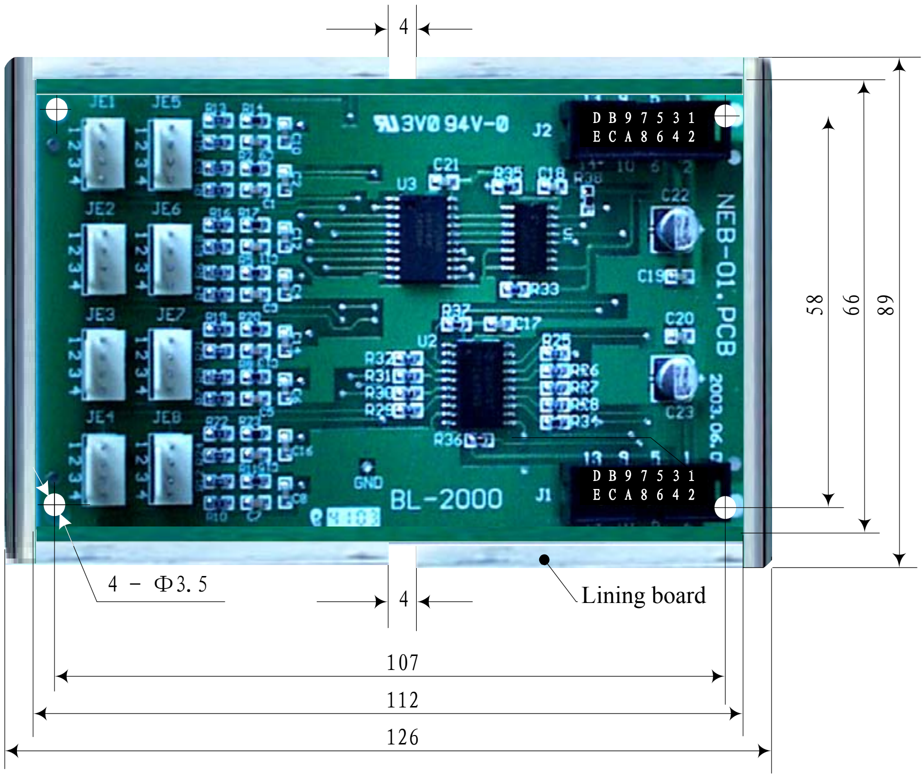


Diagram 3-3-3-1 Appearance and layout installation dimension of car expansion board BL2000-CEB

1. Instruction

Car board BL2000-CZB itself can connect with car call and response command signal; when the number of floors exceeds 8, it concatenates the car expansion board BL2000-CEB by port J1. Each car expansion board can increase the car call command for 8 floors. The car expansion boards themselves are cascade connection. The maximum number of the concatenated boards is 7.

2. connector specification (BL2000-CEB-V1/V2)

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

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

3. Port circuit

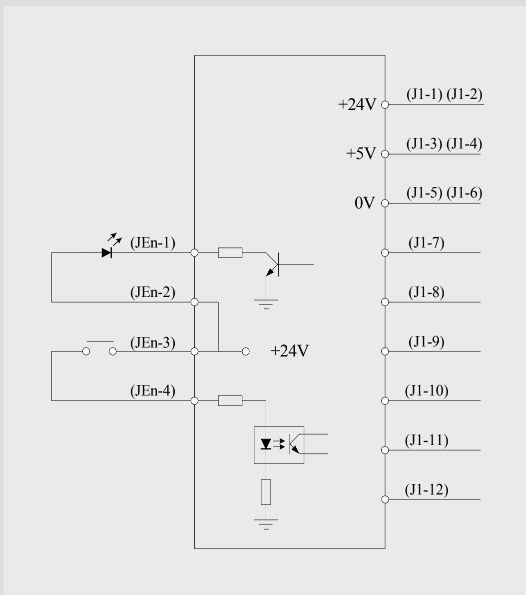


Diagram 3-3-3-2 **Wiring diagram of ports on car expanding board** BL-2000-CEB

4. Definition and specification of port

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

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

3.3.4. Call and display board BL2000-Hxx-xn

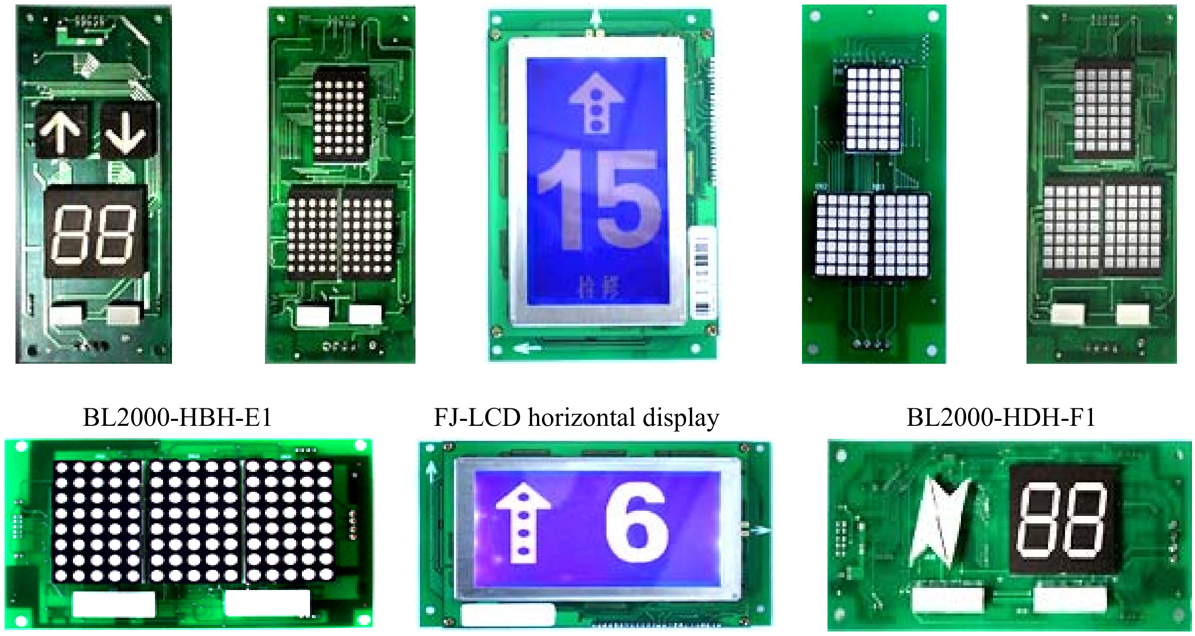


Diagram 3-3-4-1 BL2000-Photos of serial products of call and display boards

1. instruction

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

2. specification of connector (BL2000-Hxx)

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

（**2**）J2, J3single-row pin 2.54/4P (single –jacket)

（**3**）J4 double-row hole 2.54/10P

（**4**）S1,CZ,JC skip wire 2P

3. port circuit

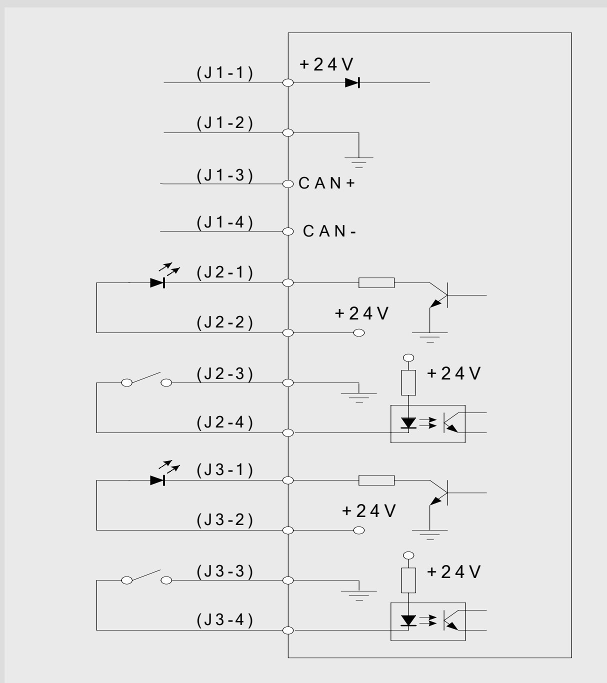


Diagram 3-3-4-11 Wiring diagram of port on BL-2000-Hxx

4. definition and specification of port

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

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

5. The setup of call and display board address

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

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

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

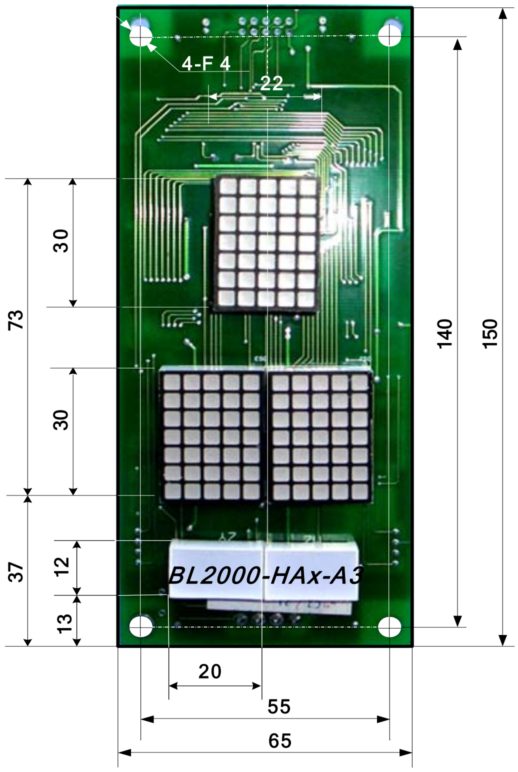
（3）Release the button 2 seconds later when the address is set, the address indicator will be twinkling and the setup will be saved.

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

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

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

7. Appearance and layout installation dimension



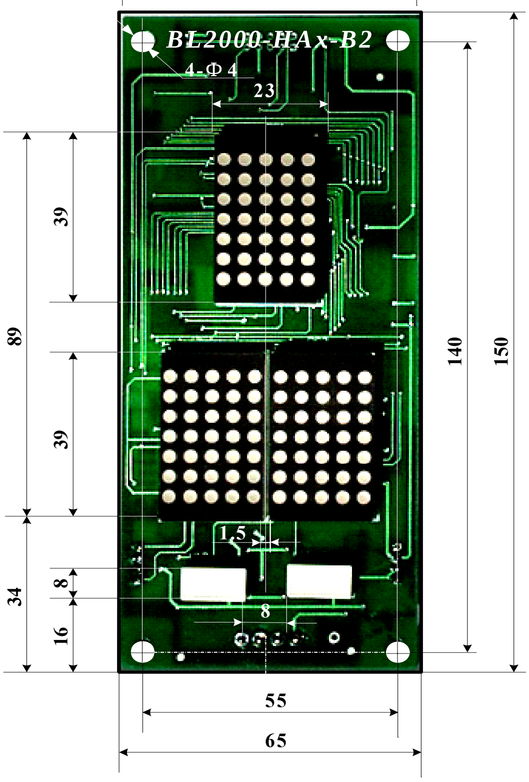
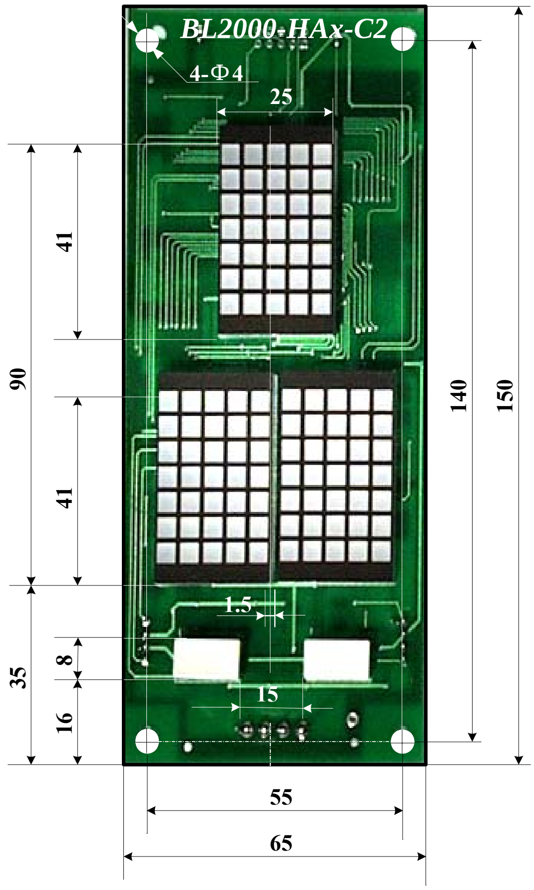


Diagram 3-3-4-2
BL2000-HAx-A3 Appearance and layout installation dimension

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



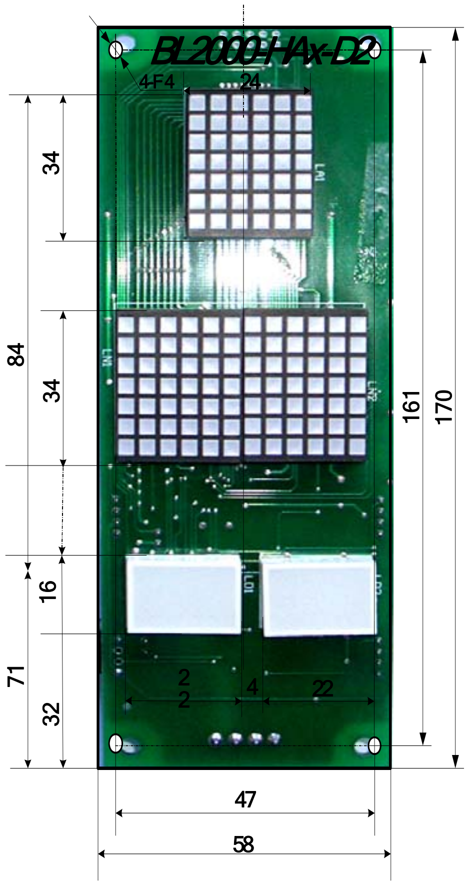
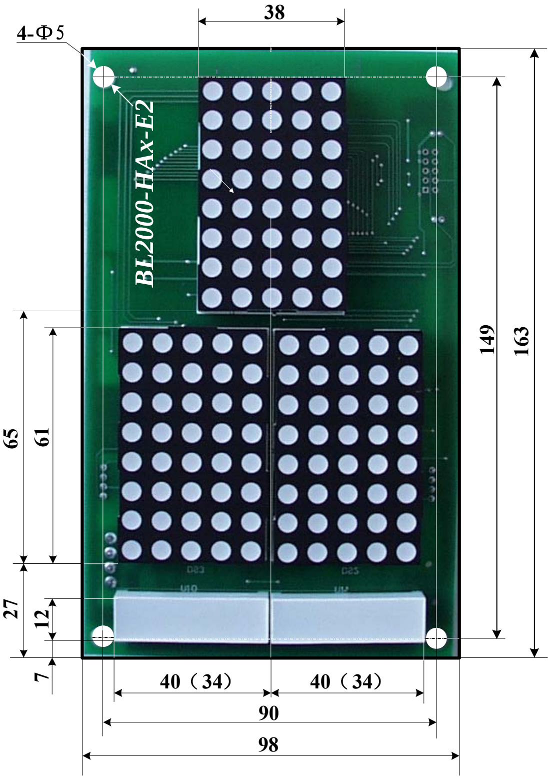


Diagram 3-3-4-4
BL2000-HAx-C2 Appearance and layout installation dimension

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



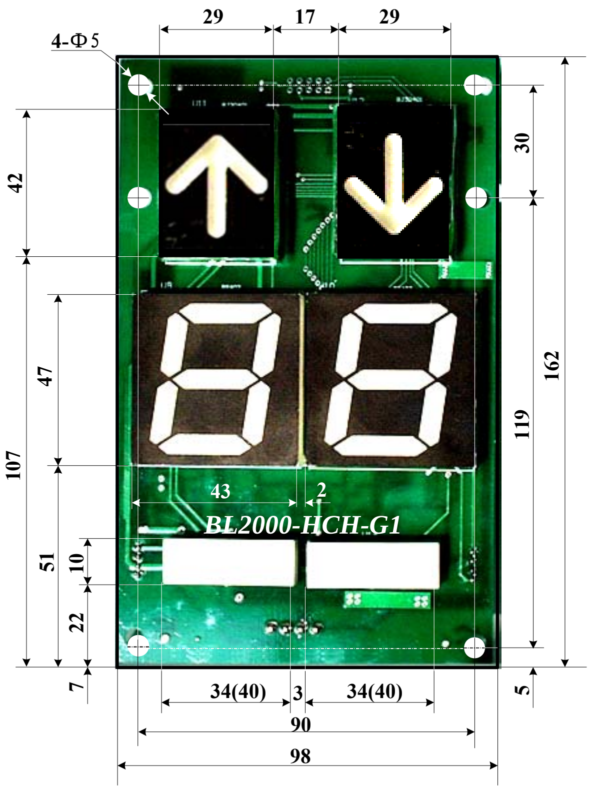
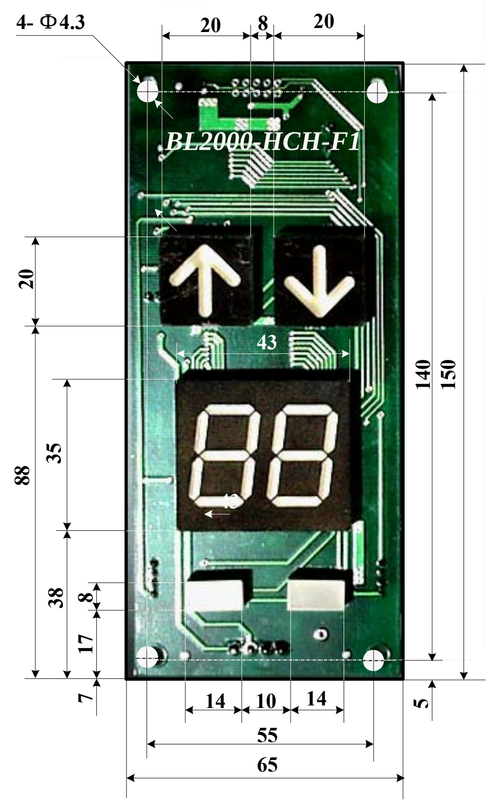


Diagram 3-3-4-6 BL2000-HAx-E2 Appearance and layout installation dimension

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



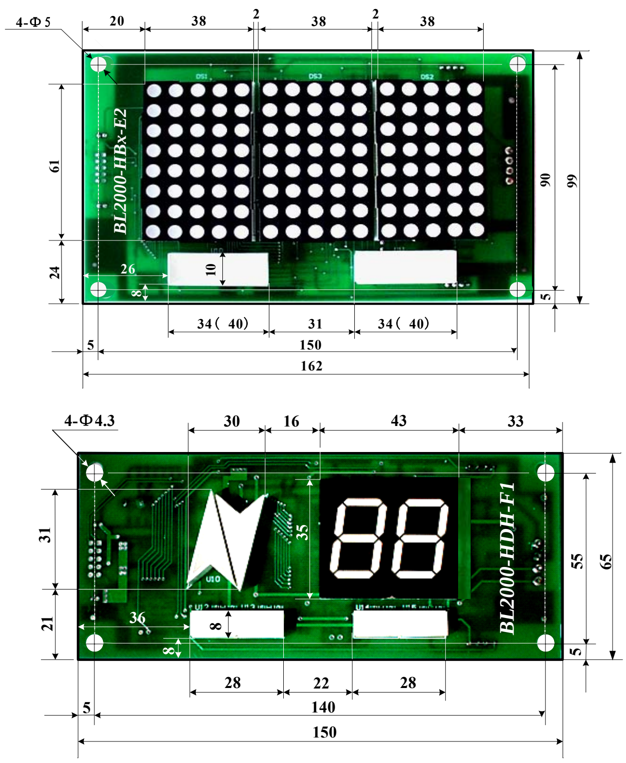


Diagram 3-3-4-8 BL2000-HCH-F1 Appearance and layout installation dimension

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

8. List of types and specification

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

Type	Specification of display block						
	Type	**Alignment**	**Appearance**	**Form**	**Color**	**L×W×H mm**	**Lightness**
BL2000-HAH-A3	1357AH	Vertical display	Square point	point array		30×22×10	High light
BL2000–HAS–A3	1357AS						over light
BL2000–HAR–A3	1357ASR						Over High light
BL2000–HAH–B2	1057AH	Vertical display	Small point	point array		39×23×8	High light
BL2000–HAS–B2	1057AS						over light
BL2000–HAR–B2	1057ASR						Over High light
BL2000–HAH–C2	1257AH		Square point	point array		42×25×7	High light
BL2000–HAS–C2	1257AS						over light
BL2000–HAR–C2	1257ASR						Over High light
BL2000–HAH–D2	1067BH		Square point	point array		34×24×6	High light
BL2000–HAH–E2	2058AH		Large point	point array		61×38×8	High light
BL2000–HAS–E2	2058AS						over light
BL2000–HAR–E2	2058ASR						Over High light

BL2000–HBH–C1	1257AH	Horizontial display	Square point	point array		42×25×7	High light
BL2000–HBS–C1	1257AS						over light
BL2000–HBR–C1	1257ASR						Over High light
BL2000–HBH–E2	2058AH	Horizontial display	Large point	point array		61×38×8	High light
BL2000–HBS–E2	2058AS						over light
BL2000–HBR–E2	2058ASR						Over High light
BL2000–HCH–F1	BS252	Vertical display	Segment	7 segment		35×42×h	Arrow dimension 22×20
BL2000–HCH–G1	BS402					46×44×10	
BL2000–HDH–F1	BS252	Horizontial display				35×42×h	

3.3.5. Group control and call board BL2000-HQK

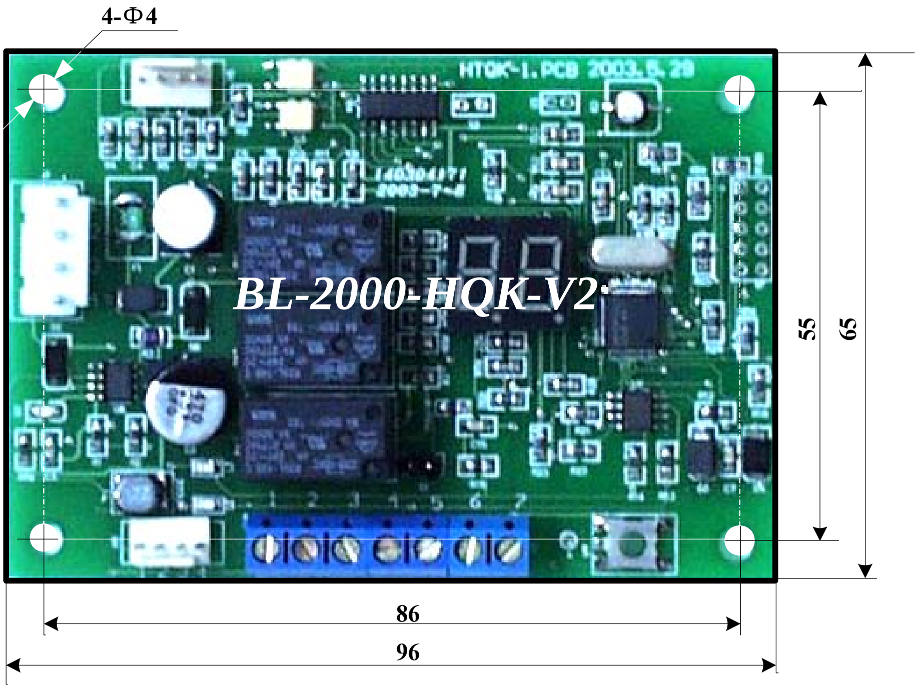


Diagram 3-3-5 Appearance and layout installation dimension of group control and call boardBL-2000-HQK

1. Instruction

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

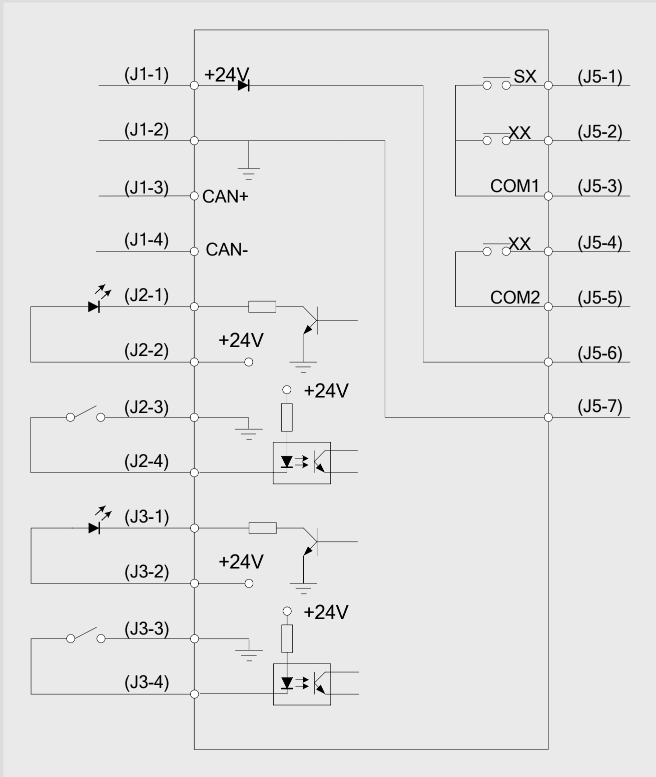


Diagram 3-3-5-1 Wiring diagram of ports on BL2000-HQK

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

（**1**）J1 single-row socket 3.96/4P

（**2**）2.54/4P

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

（**4**）J4 double-row hole 2.54/10P

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

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

（**7**）S1 skip wire 2P

3. Port circuit

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

4. Definition and specification of ports

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

Name	**Location**	**definition**	**Usage**	**technical specification of port**		
				port form	**rated load**	**Max. speed**
J1	J1-1	24V power input	Power and communication		point array 100mA 7-segment 160mA	
	J1-2	24V power ground input				
	J1-3	CAN bus H				
	J1-4	CAN bus L				
J2	J2-1	Up call response	Up running call button	OC door	Current limit	

	J2-2	24V output	input and response voltage output		resistor 120Ω	
	J2-3	24V ground output				
	J2-4	Up call input		Optical coupler	8mA	50Hz
J3	J3-1	Down call response	Down running call button input and response voltage output	OC door	Current limit resistor 120Ω	
	J3-2	24V output				
	J3-3	24V ground output				
	J3-4	Down call input		Optical coupler	DC24V8mA	50Hz
J4	Programming port					
J5	J5-1	Up running light output	output	Relay	DC5A24V AC5A250V	20 cpm Off/on time ≦5/10mS
	J5-2	Down running light output				
	J5-3	上 down running light output common				
	J5-4	Arrival gong output				
	J5-5	Arrival gong output common				
	J5-6	24V output				
	J5-7	24V power ground				
S1	Skip wire of serial communication terminal resistor (in board)					
AN	Address setup button (in board)					

3.3.6. Group control board BL2000-QKB-V1

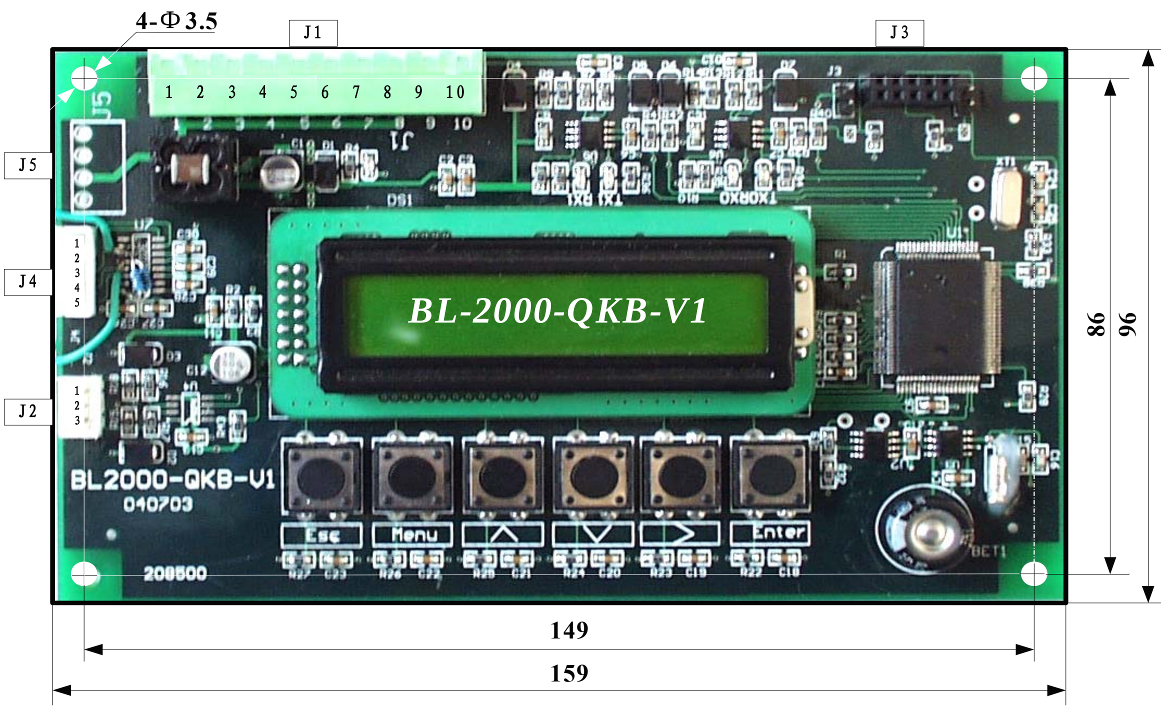


Diagram 3-3-6 Appearance and layout installation dimension of group control board BL2000-QKB-V1

1. Instruction

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

（**2**）Four running modes

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

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

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

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

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

2. Scope of application

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

（**2**）Range of speed: 0.5-4m/s；

（**3**）Applicable story: below 64 floors；

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

3. specification of connector

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

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

（**2**）J2 connector 2.54/3P

（**3**）J3 double-row hole 2.54/10P

（**4**）J4 connector 2.54/5P

（**5**）J5single jacket plug 3.96/4P

4. Port circuit

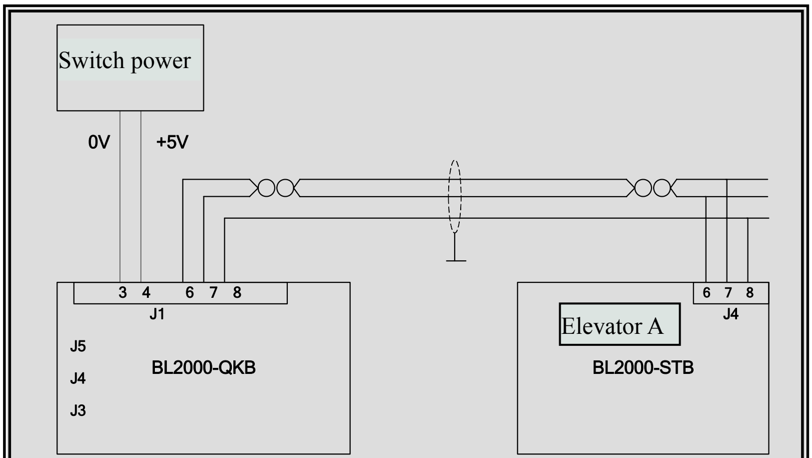


Diagram 3-3-6-1 Wiring diagram of ports on group control board BL2000-QKB-V1

5. Definition and specification of port

Table 3-2-6 Definition and specification of port group control board BL2000-QKB-V1

Name	Port No.	Location	Definition	Usage	Technical specifications		
					port form	rated load	Max. speed
J1	GND3	J1-1	0V	Power and communication			
		J1-2					
	GND3	J1-3	0V				
	5V IN	J1-4	5V input			200mA	
		J1-5					
	TXA+	J1-6	Group communication				
	TXA-	J1-7					
	GND3	J1-8	0V				
		J1-9	Standby CAN communication TXA+				
		J1-10	Standby CAN communication TXA-				
J2	DA+	J2-1		RS485			
	DA-	J2-2					
	GND	J2-3					
J3	Programming port						
J4	TX	J4-1	Communication transmit	RS323			
	RX	J4-2	Communication receive				
	IN	J4-3	Control input				
	OUT	J4-4	Control output				
J5	TXA+	J5-1	Group control communication				
	TXA-	J5-2					
	GND3	J5-3	0V				
		J5-4					

3.3.7. Introduction of load inspection device SJT-150

1. Working principle

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

2. Description of feature

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

（2）Equipped with Hall sensor of high precision and single chip

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

computer of high quality; working parameters can beset at site.

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

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

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

（6）Matching with BL2000; being used for load compensation of drive to solve the problem of sliding of gearless towing machine when starting.

3. Technical index and specification

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

（2）Sensibility:

Table 3-3-7

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

（3）Response time: ≤0.5s

（4）Output form: RS485 serial single byte output

（5）Voltage : DC 9 - 24V

4. Operating instruction

The device should be used with serial control systems of **BL2000** serial communication frequency control elevator. In normal working state, load inspecting value can take part in the controlling of system, which can achieve the functions of torque compensation, full load passby, overload voice and light alarms performed.

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

5. Definition and specification of ports

Table 3-3-8-1 Load Inspecting Device SJT-150

Name	**Port No.**	**Location**	**Definition**	**Usage**	**Technical specification**		
					port form	**rated load**	**Max. speed**
		DB9-3	RT-	Power and communication	RS485		
		DB9-7	RT+				
		DB9-4	24V				
		DB9-1	CMM				

3.3.8. Introduction of voice synthesizer SJT-YBA

1. Description of feature

Languages such as Chinese and English can be selected; broadcasting the running direction, landing floor and background

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

music. No elevator adjustment. Broadcast advertisement according to customer’s requirement.

2. Technical index and specification

(1) Language selection

(2) Broadcasting content of floor landing

(3) Background music selection

(4) Salutatory (less than 15 characters)

3. Selective voice selection

Customer can select language, background music and advertisement (details please refer to specification of SJT-YBA voice synthesizer).

4. definition and specification of port

Table 3-3-8-2 Voice synthesizer **SJT-YBA**

Name	**Port No.**	**Location**	**Definition**	**Usage**	**Technical specifications**		
					port form	**rated load**	**Max. speed**
J1	24V	J1-1	24V input power	Power and communication	CAN	800mA	
	0V	J1-2	0V				
	CANH	J1-3	CAN communication C+				
	CANL	J1-4	CAN communication C-				

3.4. BL2000 Serial Control System Typical Schematic Diagram

The manual only provides the schematic diagram of the configuration with BL2000 serial control system (serial system and auxiliary asynchronous motor) and YASKAWA inverter 616GL5 only for your reference because the system configuration used the types of parts of inverter selected by the users may vary. For the detailed application line for other different configurations, referrer to the enclosed drawings or you may contract us.

1. BL2000 Serial Control System - Frequency Variable Adjusting Speed Loop Schematic Diagram

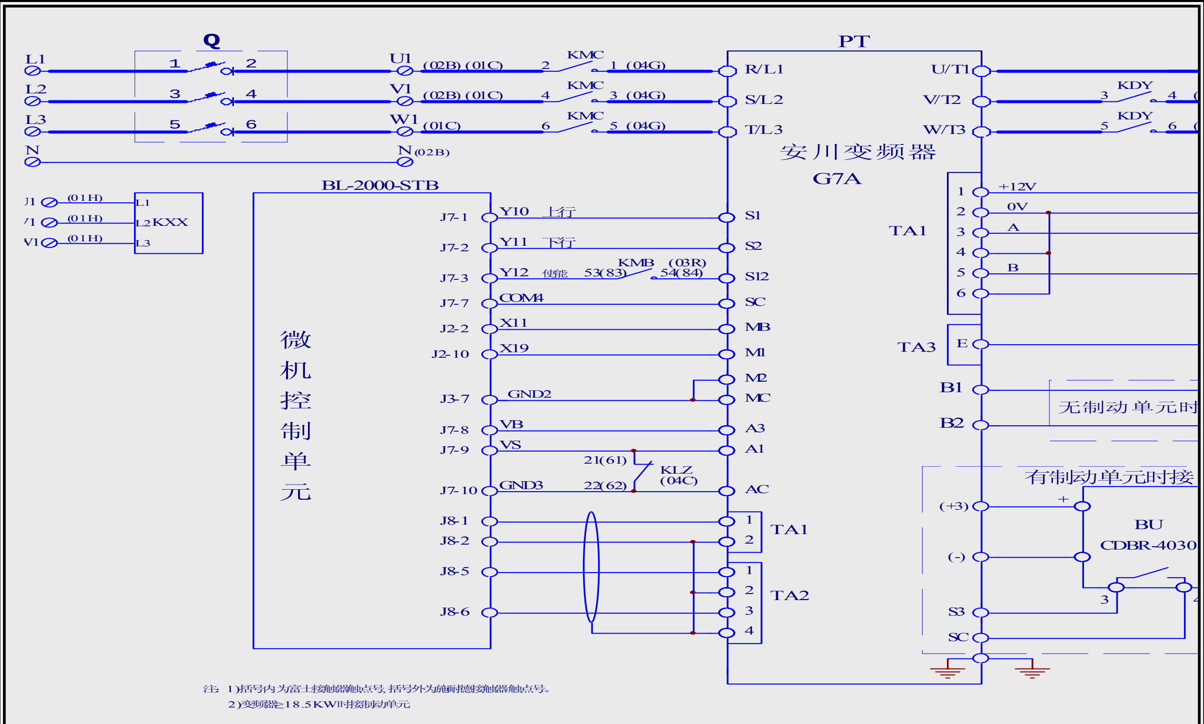


Diagram 3-4-1

安川变频器	YASKAWA inverter
微机控制单元	Computer control unit
制动电阻	Brake resistor
无制动单元时接	Connected when having no brake unit
有制动单元时接	Connected when having brake unit
注：1) 括号内为富士接触器触点号，括号	Notes: the number inside the brackets denotes

外为施耐德接触器触点号

2) 变频器≥18.5KW 时接制动单元

the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor

2. Connecting brake unit when inverter ≥18.5KW

2. BL2000 Serial Control System – Power Supply and Lighting Look Schematic Diagram

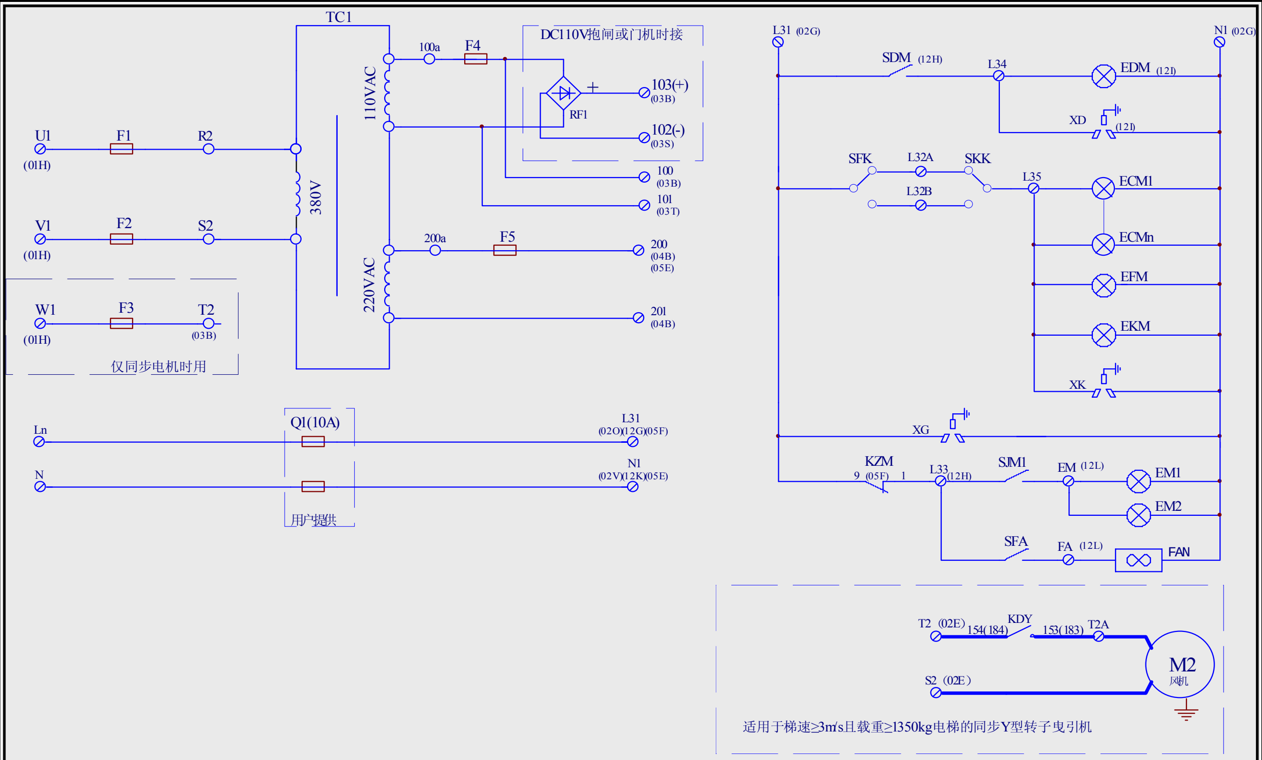


Diagram 3-4-2

抱闸或门机时接	Connected only for braking or door motor
仅同步电机时用	Only for synchronous motor
用户提供	Supplied by user
适用于梯速≥3m/s 且载重≥1350kg 电梯的同步 Y 型转子曳引机	Applicable for synchronous Y-shaped rotor PM of the elevator with speed ≥3m/s and load ≥1350kg
风机	Fan

3. BL2000 Serial Control System – Safety and Control Loop Schematic Diagram

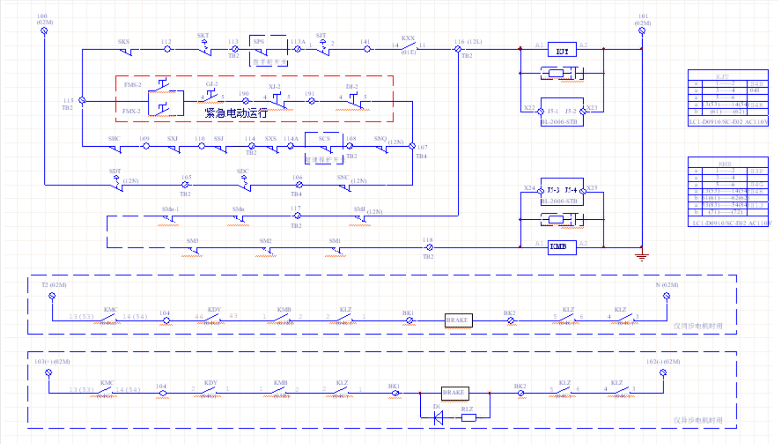


图 3-4-3

紧急电动运行	Emergency electric operation
仅同步电机时用	Only for synchronous motor
仅异步电机时用	Only for asynchronous motor

4. BL2000 Serial Control System – Control and Fire Loop Schematic Diagram

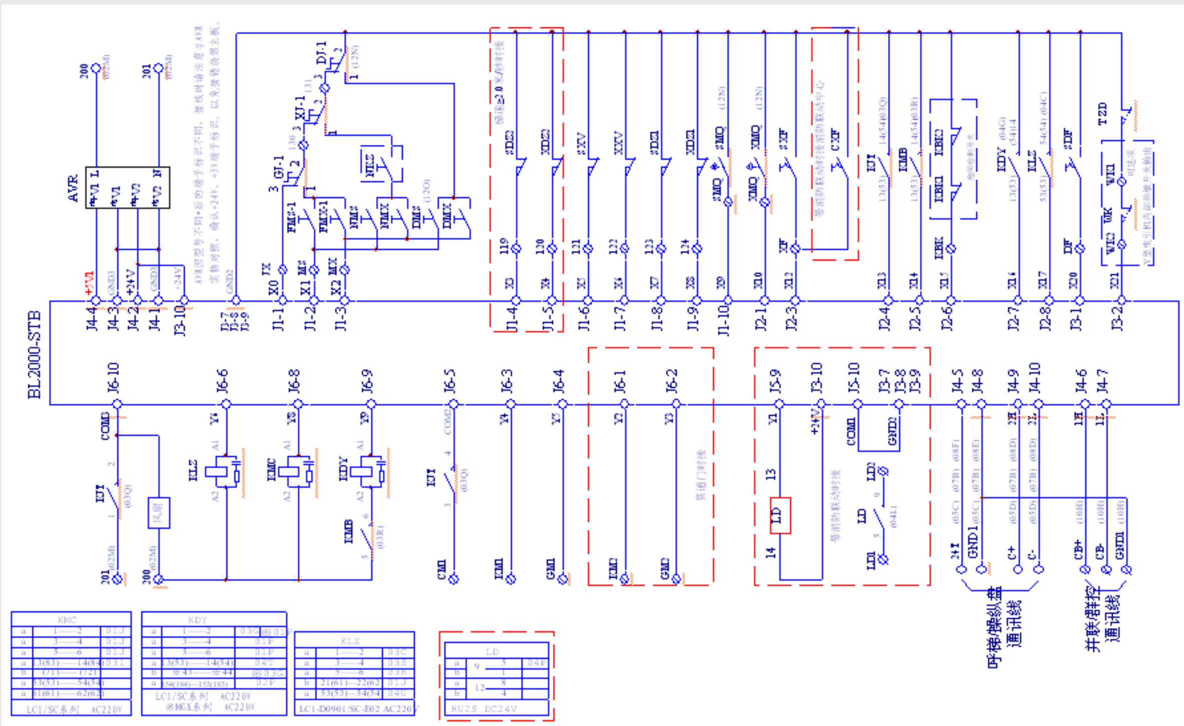


Diagram 3-4-4

呼梯/操纵盘通讯线	Call/control panel phone communication wire
并联/群控通讯线	Parallel/group communication wire

5. BL2000 Serial Control System – Car Control Loop Schematic Diagram

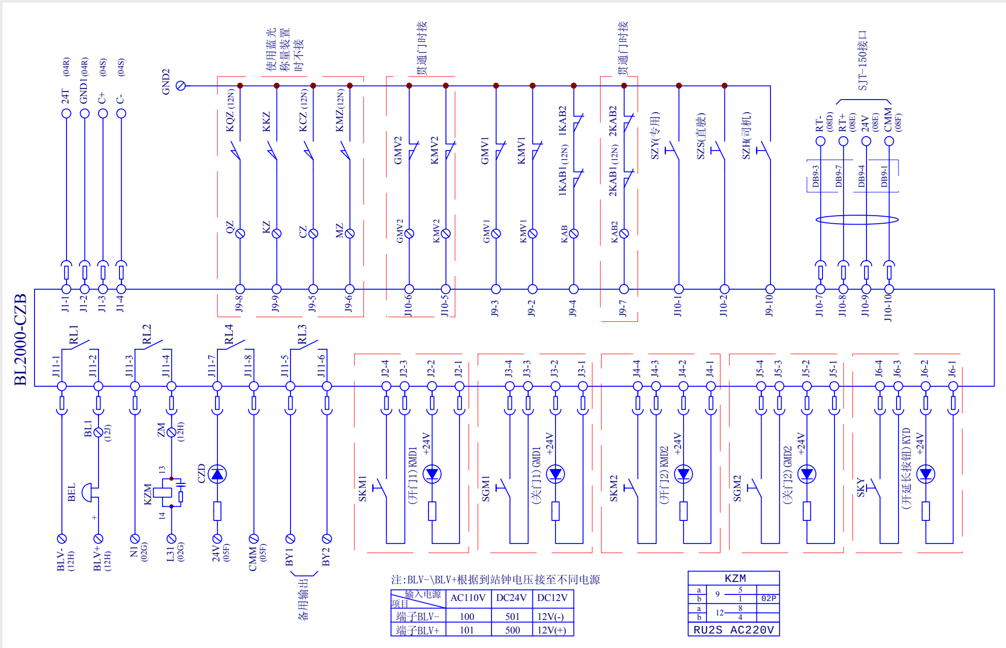


Diagram 3-4-5

使用蓝光称量装置时不接	Not connected when using Bluelight weighing device
贯通门时接	Connected for rear opening
SJT-150 接口	SJT-150 interface
专用	Special
直驶	Passby
司机	Attendant
开门	Open
关门	Close
开延长按钮	Open delay button
备用输出	Standby power output
注：BLV-、BLV+ 根据到站钟电压接至不同电源	Note: BLV- and BLV+ are connected to different powers according to the voltage of arrival gong
输入电源	Input power
项目	Item
端子	Terminal

6. **BL2000 Serial Control System – Car and Extension Board**

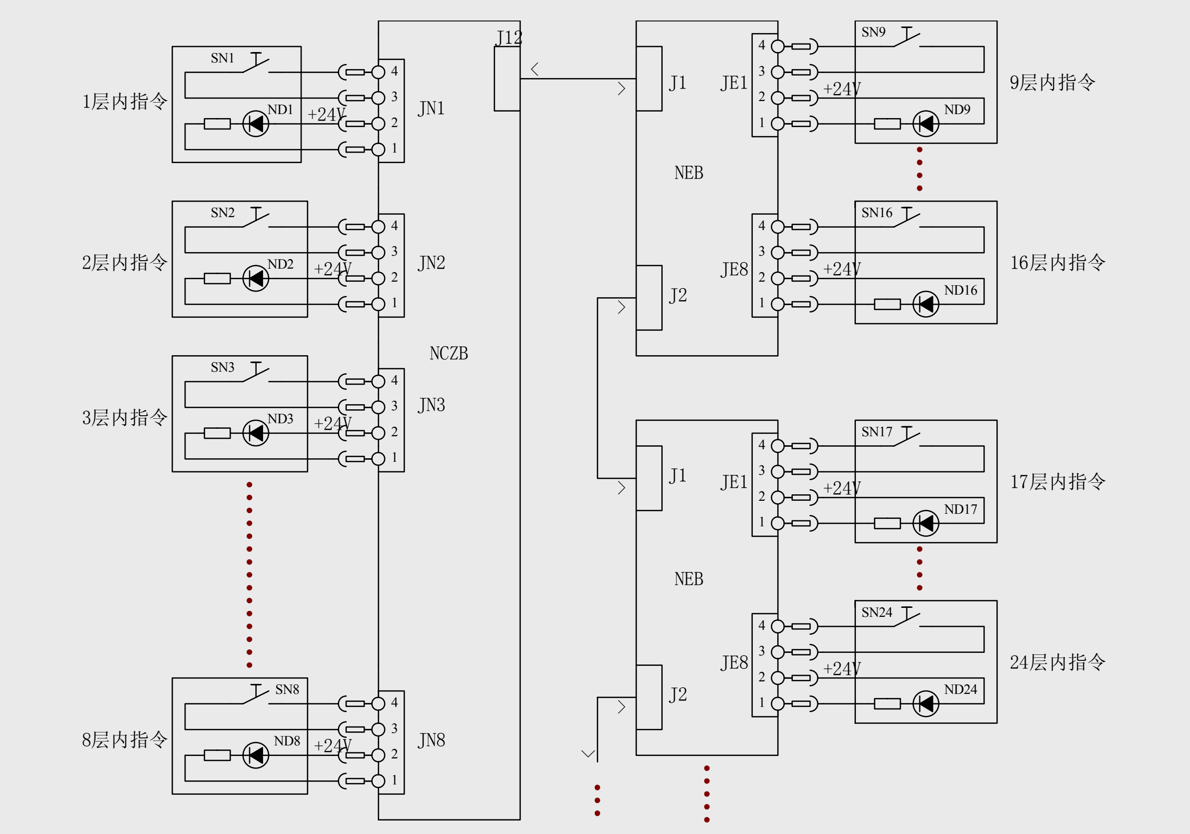


Diagram 3-4-6

1 层内指令	Call in 1st floor
2 层内指令	Call in 2nd floor
3 层内指令	Call in 3rd floor
8 层内指令	Call in 8th floor
9 层内指令	Call in 9th floor
16 层内指令	Call in 16th floor
17 层内指令	Call in 17th floor
24 层内指令	Call in 24th floor

7. BL2000 Serial Control System – Call and Display Loop Schematic Diagram

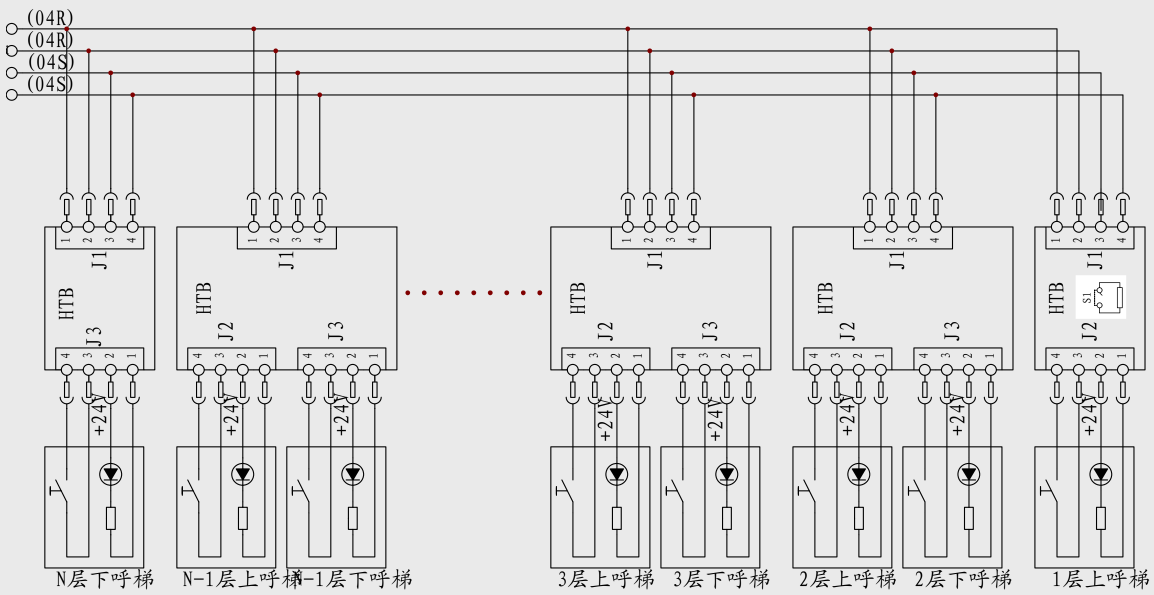


图 3-4-7

N 层下呼梯	Down Call From Floor N
N-1 层上呼梯	Up Call From Floor N
N-1 层下呼梯	Down Call From Floor N
3 层上呼梯	Up Call From 3rd Floor
3 层下呼梯	Down Call From 3rd Floor
2 层上呼梯	Up Call From 2nd Floor
2 层下呼梯	Down Call From 2nd Floor
1 层上呼梯	Up Call From 1st Floor

8. **BL2000 Serial Control System – Communication Loop Schematic Diagram**

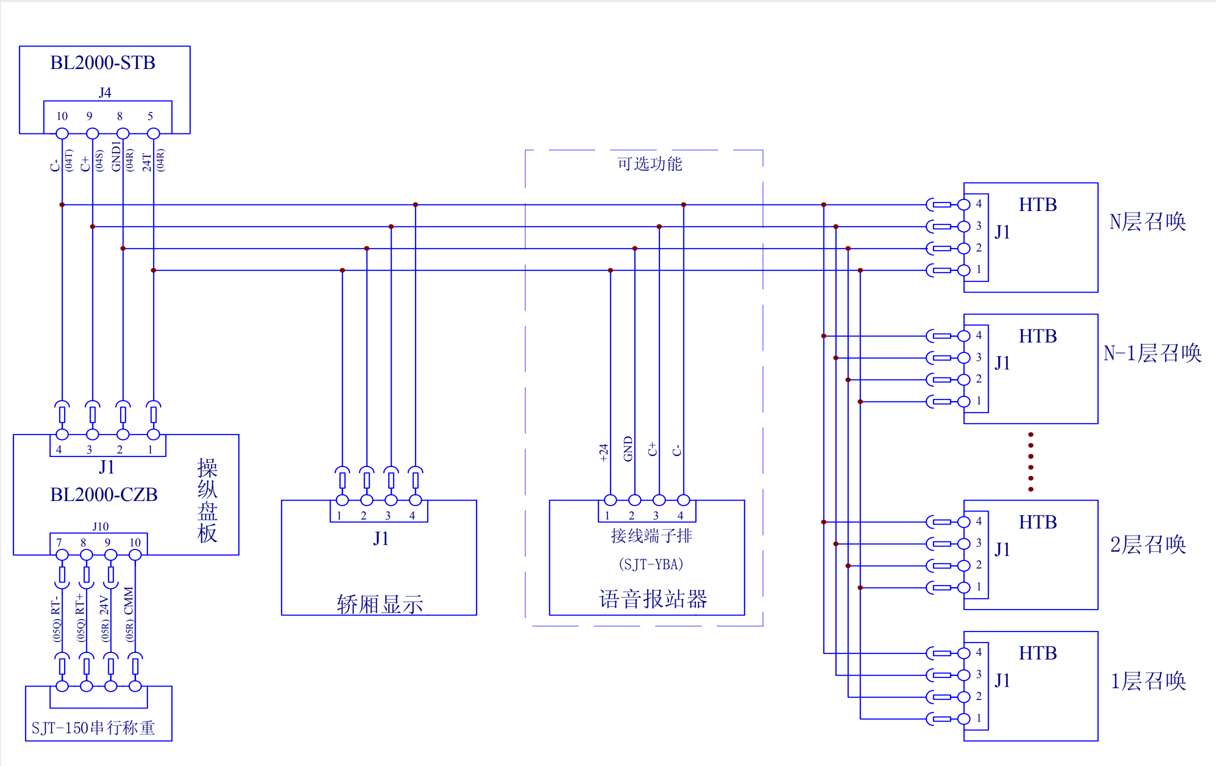


Diagram 3-4-8

可选功能	Optional function
N 层召唤	Call from floor N
N-1 层召唤	Call from floor N-1
操纵盘板	Control panel
轿厢显示	car display
接线端子排	connection terminal block
语音报站器	voice synthesizer
2 层召唤	call from 2^{nd} floor
1 层召唤	call from 1^{st} floor
SJT-150 串行称重	SJT-150 Serial Weighing

9. **BL2000 Serial Control System – Door Motor Loop Schematic Diagram**

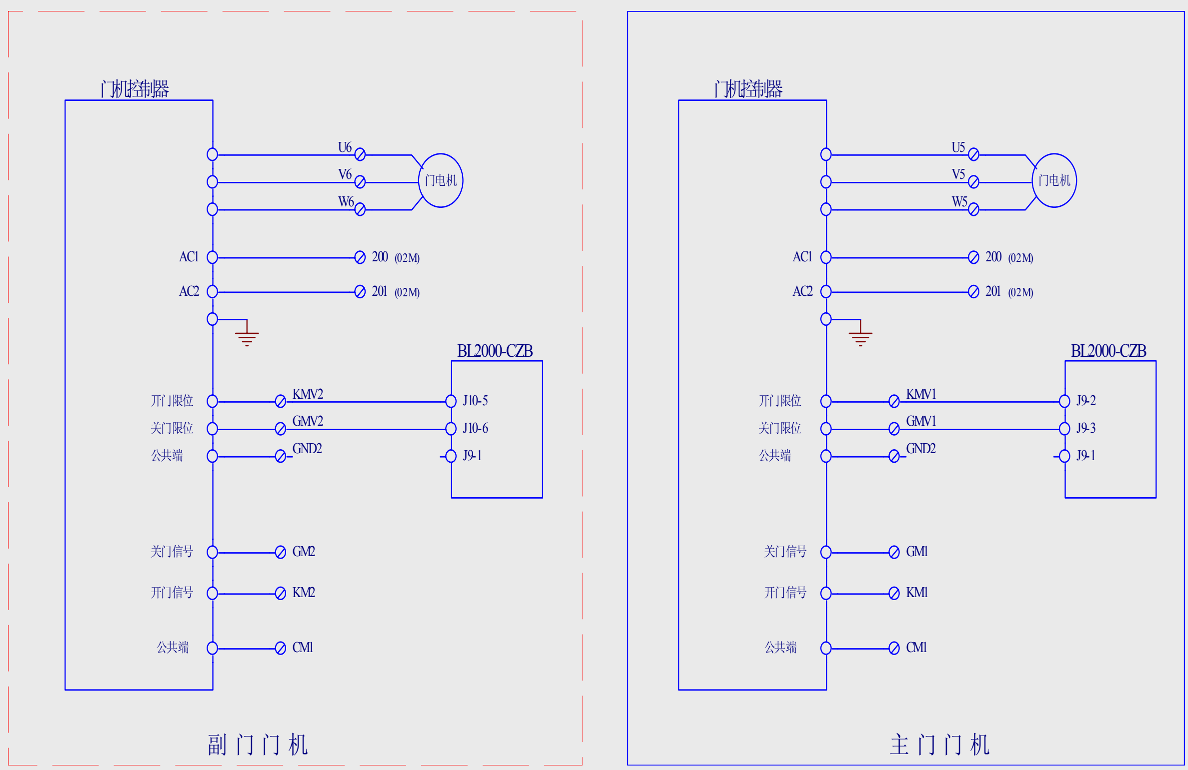


Diagram 3-4-9

门机控制器	Door motor controller
开门限位	Open door limit
关门限位	Close door limit
公共端	Common
关门信号	Open door signal
开门信号	Close door signal
副门门机	Side door motor
主门门机	Main door motor

10. BL2000 Serial Control System – Parallel Loop Schematic Diagram

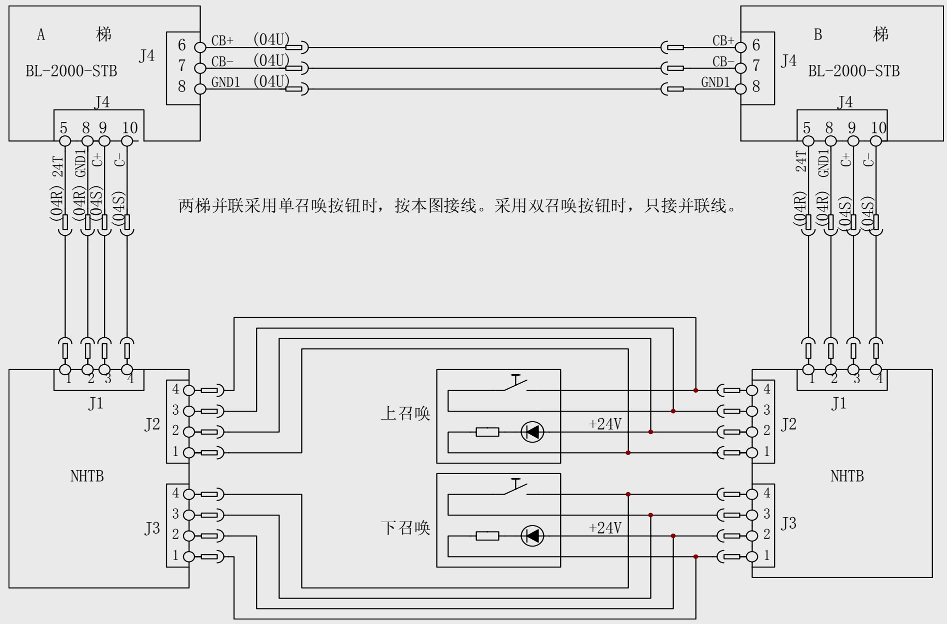


Diagram 3-4-10

A 梯	Elevator A
B 梯	Elevator B
两梯并联采用单召唤按钮时，按本图接线，采用双召唤按钮时，只接并联线。	For two elevators parallel connected, connect according to this diagram when single call button is used and only connect parallel lines when double call buttons are used.
上召唤	Up call
下召唤	Down call

11. L2000 Serial Control System – Control Cabinet Terminal and Plug-ins Location Diagram

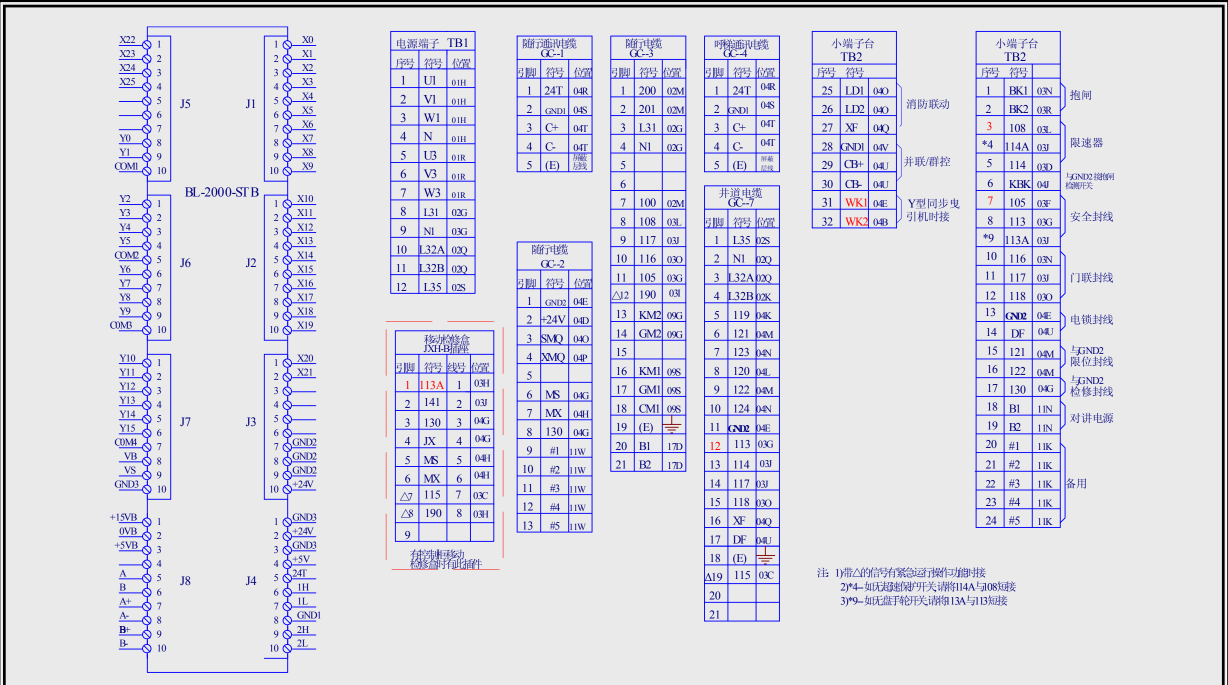


Diagram 3-4-11

电源端子 TB1	Power terminal TB1
序号	No.
符号	Symbol
位置	Location
移动检修盒 JXH-B 插座	JXH-B Socket for mobile inspection station
引脚	Pin
符号	Symbol
线号	Line No.
位置	Location
有控制柜移动检修盒时有此插件	Have this plug-in when there is controller mobile inspection station
随行通讯电缆	Trailing communication cable
引脚	Pin
符号	Symbol
位置	Location
屏蔽层线	Line for shielded layer
随行电缆	Trailing cable
呼梯通讯电缆	Call communication cable
井道电缆	Hoistway cable
小端子台	Small terminal block
序号	No.
符号	Symbol
位置	Location
消防联动	Fire linkage
并联/群控	Parallel connection/group control
Y 型同步曳引机时接	Connected for Y-shaped synchronous

抱闸	Braking
限速器	Speed limiter
与 GND2 接抱闸检测开关	Connected to braking inspection switch with GND2
安全封线	Safety seal line
门联封线	Door connection seal line
电锁封线	Electric lock seal line
与 GND2 限位封线	Limiting seal line with GND2
与 GND2 检修封线	Inspecting seal line with GND2
对讲电源	Power supply for talkback
备用	Standby

注：1) 带△的信号有紧急运行操作功能时接

2)*4-如无超速保护开关，请将 114A 与 108 短接

3) *9-如无盘手轮开关，请将 113A 与 113 短接

Notes: 1. Connect the signal remarked with △ in the case of emergency operation

2*4 – short-circuit 114A with 108 if without overspeed governor switch

3*9 – short-circuit 13A with 113 if without handwheel switch

12. BL2000 Serial Control System – Car Top Loop Schematic Diagram

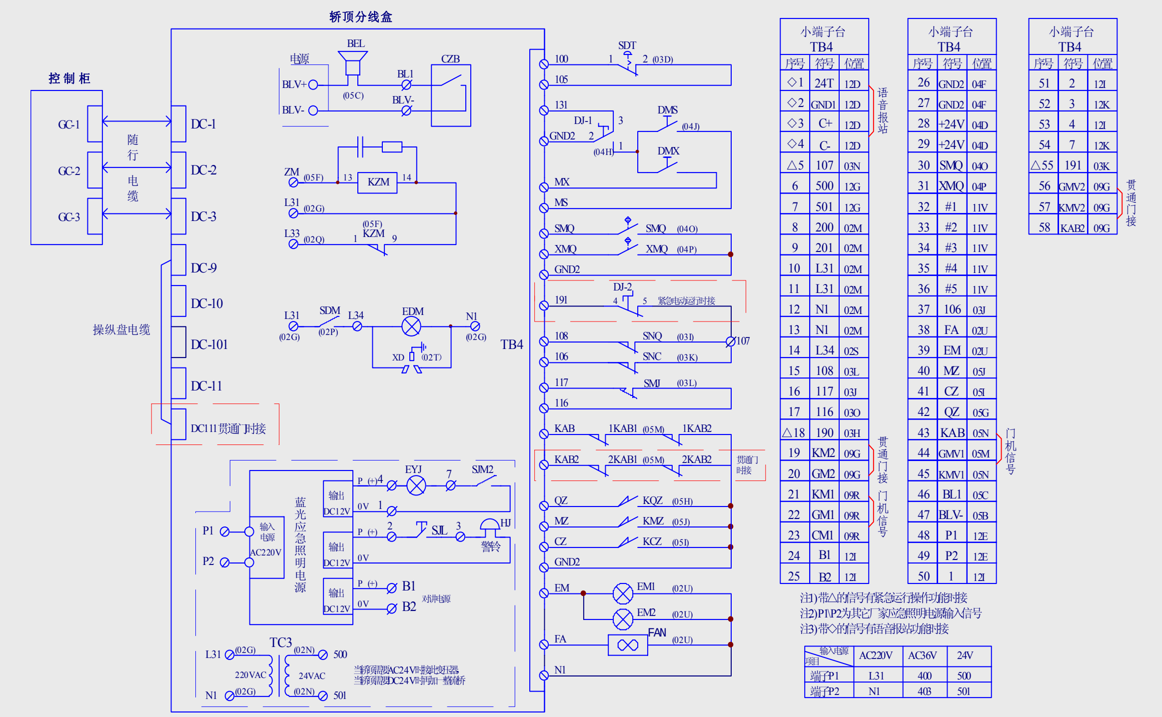


Diagram 3-4-12

控制柜	Control cabinet
随行电缆	Trailing cable
贯通门时接	Connected for rear opening
轿顶分线盒	Car top junction box
电源	Power supply
输入电源	Input power
蓝光应急照明电源	Bluelight emergency lighting power
输出	Output
警铃	Bell
对讲电源	Talkback power supply
当轿顶需要 AC24V 时接此变压器	Connect to this transformer when car top needs AD24V voltage
当轿顶需要 DC24V 时再加一整流桥	Add a rectifier bridge when car top needs DC24V voltage
紧急电动运行时接	Connected in the case of emergency electric operation
贯通门时接	Connected in the case of rear opening
小端子台	Small terminal block
序号	No.
符号	Symbol
位置	Location
语音报站台	Voice synthesizer
贯通门接	Connected in the case of rear opening
门机信号	Door motor signal
注 1：带 △的信号有紧急运行操作功能时接	Note 1: connect the signal marked with △ in the case of

注 2: P1\P2 为其它厂家应急照明电源输入信号

注 3:带 ◇的信号有语音报站功能时接

输入电源

项目

端子

emergency operation function

Note 2: P1\P2 is the input signal of the emergency lighting power from other suppliers

Note 3: connect the signal marked with ◇ in the case of voice device

Input power

Item

terminal

13. BL2000 Serial Control System – Hoistway Cable and Call Cable Connection Diagram

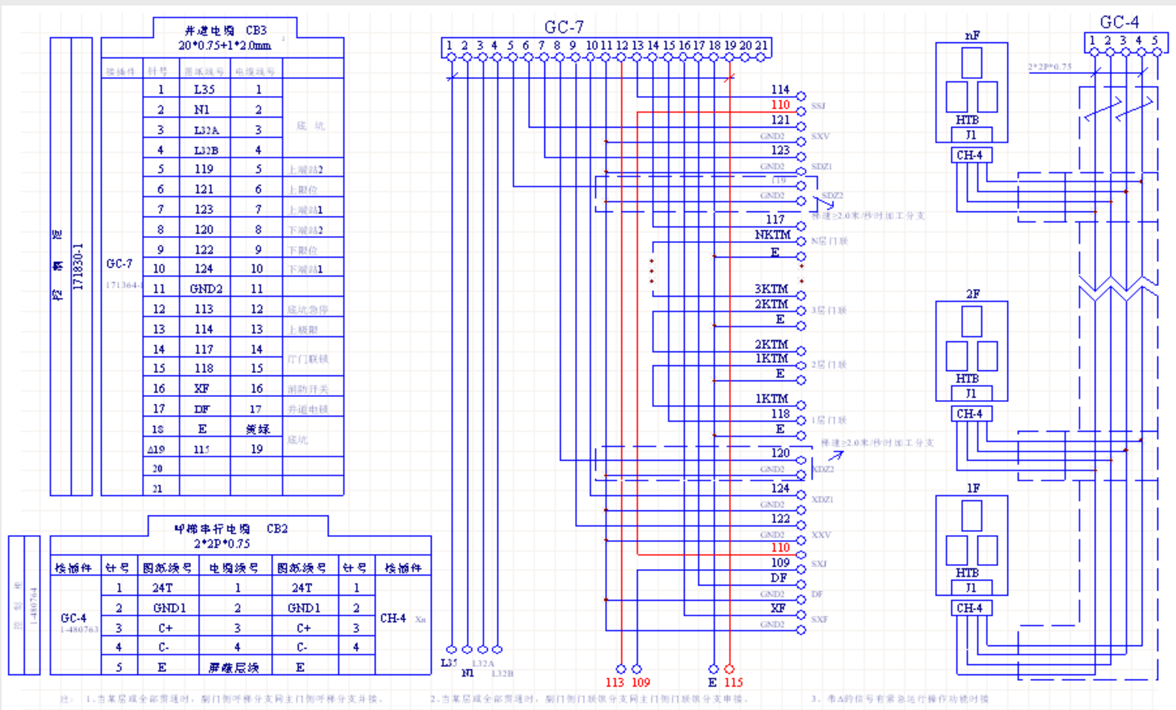


Diagram 3-4-13

14. BL2000 Serial Control System – Trailing Cable Connection Diagram 1

随行电缆 CB5 TVVBP (G) 40+1*2mm2

控制柜	接插件	针号	图纸线号	电缆线号	图纸线号	针号	接插件	轿顶
1-480764	GC-1 1-480763	1	24T	屏蔽1	24T	1	DC-1 1-480763	1-480764
		2	GND1	屏蔽2	GND1	2		
		3	C+	屏蔽3	C+	3		
		4	C-	屏蔽4	C-	4		
		5	E	屏蔽层线	E	5		
172347-1	GC-2 171358-1	1	GND2	橙色1	GND2	1	DC-2 171358-1	172347-1
		2	+24V	橙色2	+24V	2		
		3	SMQ	橙色3	SMQ	3		
		4	XMQ	橙色4	XMQ	4		
		5		橙色5		5		
		6	MS	橙色6	MS	6		
		7	MX	橙色7	MX	7		
		8	130	橙色8	130	8		
		9	#1	橙色9	#1	9		
		10	#2	橙色10	#2	10		
		11	#3	橙色11	#3	11		
		12	#4	橙色12	#4	12		
		13	#5	白色12	#5	13		

注：带△的信号有紧急运行操作功能时接

随行电缆 CB5 TVVBP (G) 40+1*2mm2

控制柜	接插件	针号	图纸线号	电缆线号	图纸线号	针号	接插件	轿顶
171830-1	GC-3 171364-1	1	200	白色1	200	1	DC-3 171364-1	171830-1
		2	201	白色2	201	2		
		3	L31	白色3	L31	3		
		4	N1	白色4	N1	4		
		5		白色5		5		
		6		白色6		6		
		7	100	白色7	100	7		
		8	108	白色8	108	8		
		9	117	白色9	117	9		
		10	116	白色10	116	10		
		11	105	黄色1	105	11		
		△12	190	黄色2	190	12		
		13		黄色3		13		
		14		黄色4		14		
		15		黄色5		15		
		16	KM1	黄色6	KM1	16		
		17	GM1	黄色7	GM1	17		
		18	CM1	黄色8	CM1	18		
		19	(E)	黄绿	(E)	19		
		20	B1	黄色9	B1	20		
		21	B2	黄色10	B2	21		

Diagram 3-4-14

随行电缆	Trailing cable
接插件	Connector
针号	Pin number
图纸线号	Line No. on drawing
电缆线号	Cable marker
屏蔽	Shielded
屏蔽层线	Line for shielded layer
橙色	Orange
白色	White
控制柜	Control cabinet
轿顶	Car top
黄色	Yellow
黄绿	Greenyellow
注:带△的信号有紧急运行操作功能时接	Note: connect to the signal marked with △ in case of emergency operation function

15. BL2000 Serial Control System – Trailing Cable Connection Diagram 2 (Car Cable)

		操纵盘电缆 I CB9-1 (12*0.75)		操纵盘 CZB 端子	
接插件	针号	图纸线号	电缆线号	图纸线号	
轿顶 DC-10	1	MZ	1	MZ	
	2	CZ	2	CZ	
	3	KAB	3	KAB	
	4	GMV1	4	GMV1	
	5	KMV1	5	KMV1	
	6	GND2	6	GND2	
	7	ZM	7	ZX	
	8	N1	8	N1	
	9	BL1	9	BL1	
	10	BLV-	10	BLV-	
	11	QZ	11	QZ	
	12	E	黄绿	E	

		操纵盘电缆 I' CB9-2 9芯1条		操纵盘端子台	
接插件	针号	图纸线号	电缆线号	图纸线号	
轿顶 DC-101	1	P1	1	P1	
	2	P2	2	P2	
	3	1	3	1	
	4	2	4	2	
	5	3	5	3	
	6	4	6	4	
	7	7	7	7	
	△8	190	8	190	
	△9	191	9	191	

贯通门时接此插件		操纵盘电缆III CB9-4 2芯2条		操纵盘端子台	
接插件	针号	图纸线号	电缆线号	图纸线号	
轿顶 DC-111	1	GMV2	1	GMV2	
	2	KMV2	2	KMV2	
	3	KAB2	1	KAB2	

		操纵盘电缆II CB9-3 TVV15 (15*0.75)		操纵盘 端子台	
接插件	针号	图纸线号	电缆线号	图纸线号	
轿顶 DC-9	1	B1	1	B1	
	2	B2	2	B2	
	3	#1	3	#1	
	4	#2	4	#2	
	5	130	5	130	
	6	131	6	131	
	7	MS	7	MS	
	8	MX	8	MX	
	9	105	9	105	
	10	106	10	106	
	11	L33	11	L33	
	12	FA	12	FA	
	13	EM	13	EM	
	14	#3	14	#3	
	15	#4	15	#4	

		操纵盘电缆 CB4 2*2P*0.75					
接插件	针号	图纸线号	电缆线号	图纸线号	针号	接插件	
轿顶 DC-11	1	24T	1	24T	1	CH-4	CZB-01 J1
	2	GND1	2	GND1	2		
	3	C+	3	C+	3		
	4	C-	4	C-	4		
	5	E	屏蔽层线	E			
			1	24T	1	CH-4	轿箱显示板 J1
			2	GND1	2		
			3	C+	3		
			4	C-	4		
			屏蔽层线	E			

注:带△的信号有紧急运行操作功能时接

Diagram 3-4-15

操纵盘电缆 I	Operation panel cable I
操纵盘 CZB 端子	Operation panel CZB terminal
接插件	Connector
针号	Pin No.
图纸线号	Line No. on drawing
电缆线号	Cable marker
轿顶	Car top
操纵盘电缆 I' CB9-2	Operation panel cable I' CB9-2
9 芯 1 条	One 9-core cable
操纵盘端子台	Operation panel terminal block
贯通门时接此插件	Connect this plug-in in the case of rear opening
操纵盘电缆 II CB9-4	Operation panel cable II CB9-4
2 芯 2 条	Two 2-core cables
操纵盘端子台	Operation panel terminal block
屏蔽层线	Line for shielded layer
轿厢显示板	Car display panel
注:带△的信号有紧急运行操作功能时接	Note: connect to the signal marked with △ in case of emergency operation function

16. L2000 Serial Control System – Hoistway Switch Location Diagram

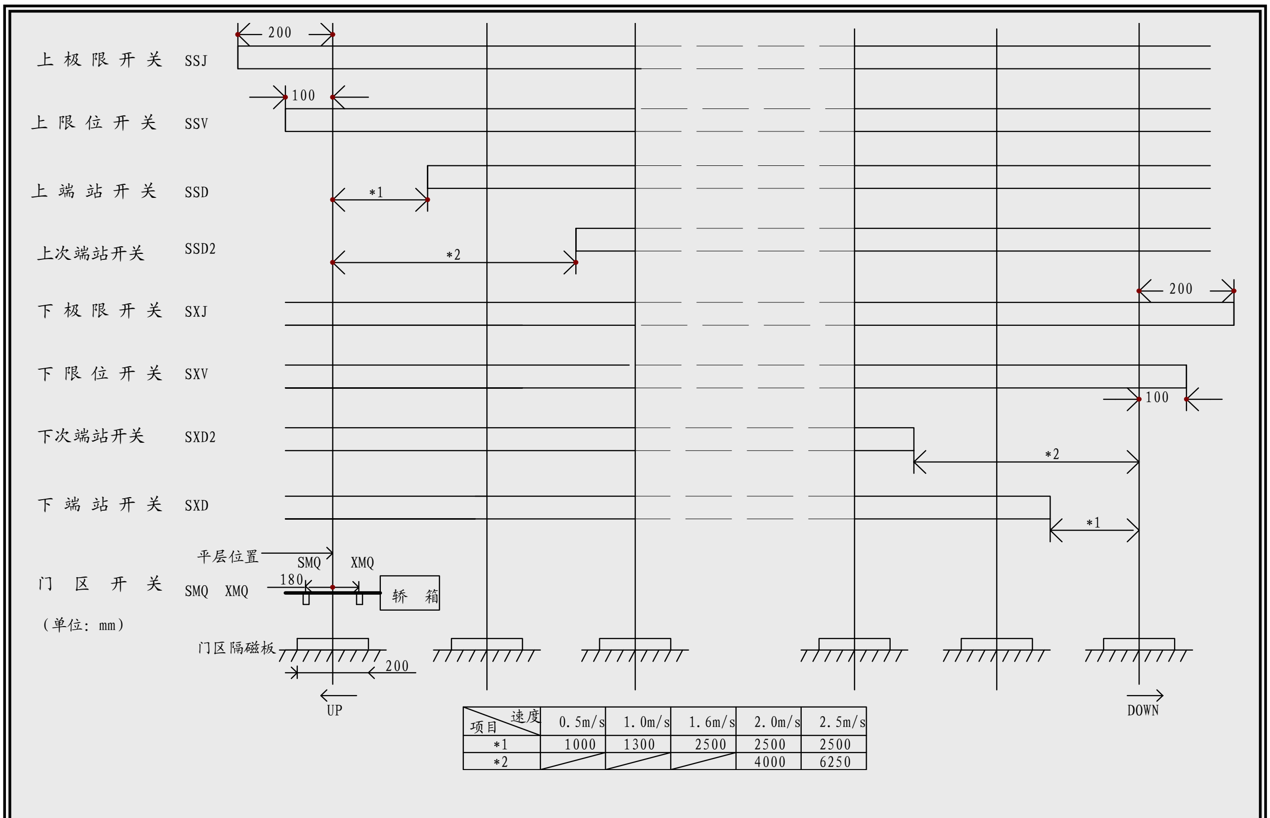


Diagram 3-4-16

上极限开关	Final Limit Switch Up
上限位开关	Limit Switch Up
上端站开关	Terminal Landing Switch Up
上次端站开关	Secondary Terminal Landing Switch Up
下极限开关	Final Limit Switch Down
下限位开关	Limit Switch Down
下次端站开关	Secondary Terminal Landing Switch Down
下端站开关	Terminal Landing Switch Down
平层位置	Leveling Position
门区开关	Landing Switch
轿厢	Car
单位	Unit
门区隔磁板	Landing Magnet Vane
速度	Speed
项目	Item

17. BL2000 Serial Control System – Talkback System Schematic Diagram

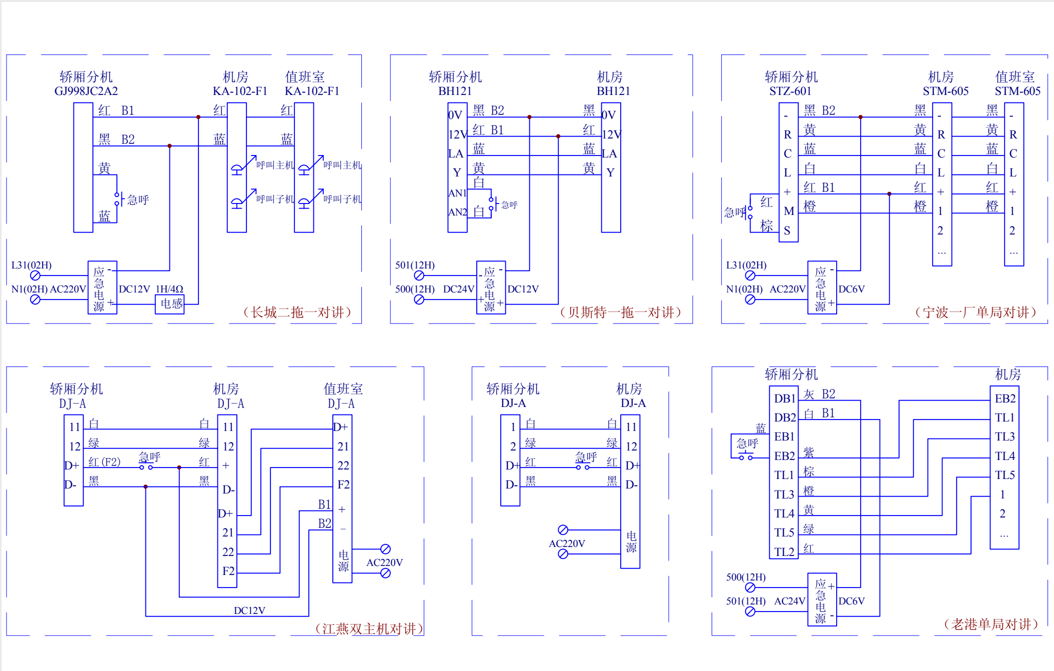


Diagram 3-4-17

轿厢分机	Extension within car
机房	Machine room
值班室	Duty room
红	Red
黑	Black
黄	Yellow
蓝	Blue
呼叫主机	Calling host
呼叫子机	Calling terminals
急呼	Emergency call
应急电源	Emergency power supply
电感	Inductance
长城二拖一对讲	GreatWall One-Drive-Two Talkback
轿厢分机	Extension within care
机房	Machine room
值班室	Duty room
白	White
绿	Green
红	Red
黑	Black
电源	Power supply
江燕双主机对讲	Jiangyan double host talkback
贝斯特一拖一对讲	Best one-drive-one talkback
红	Red

橙	Orange
棕	Brown
宁波一厂单局对讲	Single-office talkback of Ningbo No. 1 Factory
灰	Gray
白	White
紫	Purple
棕	Brown
老港单局对讲	Laogang single-office talkback

3.5. BL2000 Serial Control System Parts List

Code	Name	Main Function	Location
1KAB1 1KAB2	Safety contractor switch 1		Door mechanism
2KAB1 2KAB2	Safety contractor switch 2		Door mechanism
AVR	Switch power supply	Work power of main board. Two sets of power supply with input voltage AC220V and output voltage DC24V and DC5V. ▲**Note:** must ground the switch power supply reliably, otherwise it may cause abnormal operation of main board.	Cabinet
BEL	Arrival gong		Car top
BL2000-STB	Control cabinet panel		Cabinet
BU	Brake unit		Cabinet
CXF	Fire center		Machine room
CZD	Overload lamp (option)		Car
D1	Brake freewheel diode		Cabinet
DF	Hoistway electric lock		Hoistway
DJ	Car top inspection switch		Car top
DMS	Car top slow-up button		Car top
DMX	Car top slow-down button		Car top
EDM	Car top light		Car top
EKM	Pit light		Pit
EM1 EM2	Car light		Car
EYJ	Emergency light		Car
F1/F2/F3	Control power supply breaker	Controlling master power supply;	Cabinet
F4	110V control supply breaker	Controlling 110V power supply;	Cabinet
F5	220V control supply breaker	Controlling 220V power supply;	Cabinet
FAN	Car fan		Car
FMS	Machine room slow-up button		Cabinet
FMX	Machine room slow-down button		Cabinet
GJ	Control cabinet inspection switch		Cabinet
GMV1	Open door limit switch 1		Door mechanism
GMV2	Open door limit switch 2		Door mechanism
HJ	Bell		Car top

KBK1 KBK2	Brake inspection switch		Hoisting machine
KCZ	Overload switch		Platform
KDY	Running contactor	Used for controlling the circuit between inverter output and motor and the circuit is connected when the contactor pulls in.	Cabinet
KER	Fault relay	The relay will release in case of inverter failure. (used for KEB F4 inverter)	Cabinet
KFX	△ Star enclosure contactor	Used for synchronous hoisting machine (option)	Cabinet
KGM	Close door contactor	Door motor will execute the action of Close door when the contactor pulls in.	Cabinet
KJR	Braking economy resistance contractor (option)	Connecting economy resistance when the contractor releases (not connect for below 16^{th} floor)	Cabinet
KJT	Emergency stop contactor	The contactor pulls in when emergency stop loop closes.	Cabinet
KKM	Open door contactor	Door motor executes the action of Close door when this contactor pulls in.	Cabinet
Code	**Name**	**Main function**	**Location**
KKZ	No-load switch		Platform
KLZ	Braking contactor	Brake opens when this contactor pulls in.	Cabinet
KMB	Door interlock contactor	When door interlock loop closes, this contactor pulls in.	Cabinet
KMC	Contactor	Used for controlling the power supply for inverter, which can be powered on to operate only when this contactor pulls in.	Cabinet
KMV1	Open door limit switch 1		Door mechanism
KMV2	Open door limit switch 2		Door mechanism
KMZ	Full load switch		Platform
KQZ	Underload switch		Platform
KXX	Phase sequence relay		Cabinet
KZM	Lighting-control relay		Car top
KZZ	Overload switch		Platform
LD	Fire relay (option)		Cabinet
BRAKE	Brake coil		Hoisting machine
M1	Hoisting machine		Machine room
NCB	Car board		Car
NEB	Car expansion board		Car
NECM	Hoistway standing light		Hoistway
Hxx	Call and display boards		Call box
NKZ	Car slow-up/slow-down		Car

	control button		
NMS	Car slow-up button		Car
NMX	Car slow-down button		Car
PG	Rotary encoder		Machine room
PT	Frequency inverter	Variable speed drive for elevator running, controlled by main board and its type will be selected by user.	Cabinet
Q	Master control supply air switch (Party A)		Machine room
Q1	Hoistway lighting power air switch (Party A)		Machine room
RC	Arc extinguisher		Cabinet
RF1	110V rectifier bridge	Outputting 110V DC voltage.	Cabinet
RJ	Braking economy resistance (option)		Cabinet
RLZ	Brake follow current resistance		Cabinet
RMD	Door motor resistor		Cabinet
RZD	Braking resistor		Cabinet
SCS	Up overspeed protection switch		Machine room
SDC	Car emergency stop button		Car
SDF	Electric lock switch		Home floor
SDM	Car top light switch		Car top
SDT	Car top emergency button		Car top
SDZ1	Up terminal switch 1		Hoistway
SDZ2	Up terminal switch 2		Hoistway
SFA	Car fan switch		Car
SFK	Hoistway lighting control switch		Machine room
Code	**Name**	**Main function**	**Location**
SGM1	Close door button 1		Car
SGM2	Close door button 2		Car
SHC	Pit buffer switch		Pit
SJL	Bell button		Car
SJM1	Car light switch		Car
SJT	Cabinet emergency switch		Cabinet
SKK	Pit light switch		Pit
SKM1	Open door button 1		Car
SKM2	Open door button 2		Car
SKS	Governor broken step chain device		Pit

SKT	Pit emergency button		Pit
SKY	Open door delay button		Car
SMJ	Car door switch		Car
SMn	Hall door switch		Landing door lock
SMQ	Upper landing switch		Car top
SNC	Emergency opening switch		Car top
SNQ	Safety gear switch		Car top
SPS	Handwheel switch		Machine room
SSJ	Final limit switch up		Hoistway
SXF	Fireman's switch		Home floor
SXJ	Final limit switch down		Hoistway
SXS	Governor switch		Machine room
SXV	Limit switch up		Hoistway
SZH	Attendant's switch		Car
SZS	Non-stop switch		Car
SZY	Special switch		Car
TC1	Control supply transformer	Supplying working power for control cabinet. Input voltage is AC380V and output voltage is AC220V and AC110V.	Cabinet
TZD	Braking resistor thermoswitch	Used for monitoring overheat of brake resistor and breaks when the temperature of switch is higher than 100℃.	Cabinet
WR	Door motor excitation winding		Within door motor
XD	Car top light socket		Car top
XDZ1	Down terminal switch 1		Hoistway
XDZ2	Down terminal switch 2		Hoistway
XG	Power socket		Cabinet
XJ	Car inspection switch		Car
XK	Pit light socket		Pit
XMQ	Lower landing switch		Car top
XXV	Limit switch down		Hoistway
Remarks	1. The parts in this list are only for reference in the case of BL2000-STB is used with BL2000-STB with Yasukawa inverter and asynchronous motor. 2. If any changes, please refer to the enclosed documents.		

Chapter 4 The Installation of BL200 Serial Control System

4.1. Important Notes

1. The products made in our company have been strictly inspected through automatic inspection line and usually can be can be normally installed and used, except for some accidental damages during the transportation process (please refer to the content of “arrival check” in this manual).
2. The users who have bought our products are expected to carefully read the manual and the manuals related to the system or that for the equipment that are used for this system before the installation and assembly, and carry out the installation and assembly according to the instructions in this manual, the enclosed documents and the manuals related to the system or that for the equipment that are used for this system , to avoid the accidental losses.。
3. The users who have bought the bare control system and board products of our company are expected to carefully understand the scope of application, application condition, performance, installation dimension, interface parts type and its specification and technical requirements of the installation to avoid the accidental losses, except for some relevant functional features,
4. If the content of this manual can not satisfy your demand, please immediately contact our company for instant assistance for avoiding the accidental losses during the installation and usage.

4.2. Incoming Inspection

1. Before opening the packaging firstly check the arrival list, dispatch list against the actual packages (volume , weight and so on)；
2. Before opening the packaging, check if there is any breakage on the packaging and if there is any possibility that the internal parts are broken；
3. Check if the original sealing of the packaging are broken (including external and internal packaging)；
4. After opening the packaging, check if the appearance of the internal parts is in bad condition；
5. Check if the packing list is consistent with the order;
6. Check the contents of the packing list with the parts names, specification, types and quantity；
7. Other abnormal conditions.
▲Note：In case any of the above circumstances, please contact the consigner or our company.

4.3. System Installation

4.3.1. Technical requirements of installation

1. Please install the elevator according to *GB7588-2003 Elevator Manufacture and Installation Regulation*.
2. Please install the elevator according to the installation technical requirements in the introduction of the system (parts) and connecting equipment (apparatus).
3. Please confirm that the installation environment can not badly affect the system (parts) and the installation result.
4. Please confirm that the installation staffs are qualified for the installation of the system (parts).
5. For the equipment for which technical requirements are not covered in the manual, please conduct the

installation according to the practices related to the industry or the profession.

4.3.2 Installation of BL2000 Series Parts

1. The installation of the circuit board

（**1**）Note the direction (for example, the **J1~J4 of main board are at the upper place, and J5~J8 are at the lower place.**) ；

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

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

（**4**）Guarantee insulation and grounding.

2. Installation of connector

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

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

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

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

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

4.3.3. Installation of the system and other parts

1. Installation and connection of rotary encoder

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

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

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

（**3**）The encoder cables should correspondingly connect with the appointed ports of the inverter and appointed ports of the main board. Wrong wire connection will damage the rotary encoder；The cables of the rotary encoder should be covered inside the metal tube and kept away from the power wires.

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

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

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

Two landing switches and several landing bridge plates (each for every floor) can control the elevator leveling, when the elevator speed is over 2 m/s, 250 mm landing bridge plate is suggested to be used. The two landing switches should be installed on the top of the car, the bridge plate of the landing should be installed in the hoistway, please see the diagram 4-3-3-1 for its dimension and installation position: the landing switch can adopt photoelectric switch or magnetic switch.

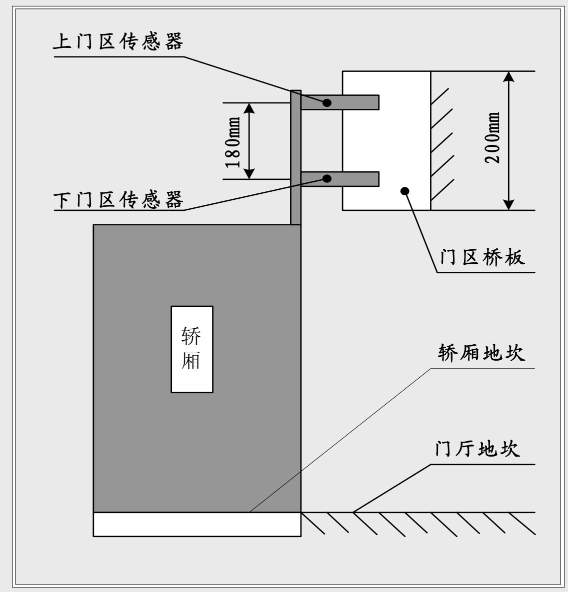


图 **4-3-3-1** 门区开关与门区桥板安装示意图

上门区传感器 upper landing sensor

下门区传感器 lower landing sensor

门区桥板 landing bridge plate

轿厢地坎 car sill

图 4-3-3-1 门区开关与门区桥板安装示意图

Diagram 4-3-3-1 Installation diagram of landing switch and landing bridge plate

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

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

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

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

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

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

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

List 4-3-3 Reference list of upper/lower terminal installation position when the elevator runs in different speed

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

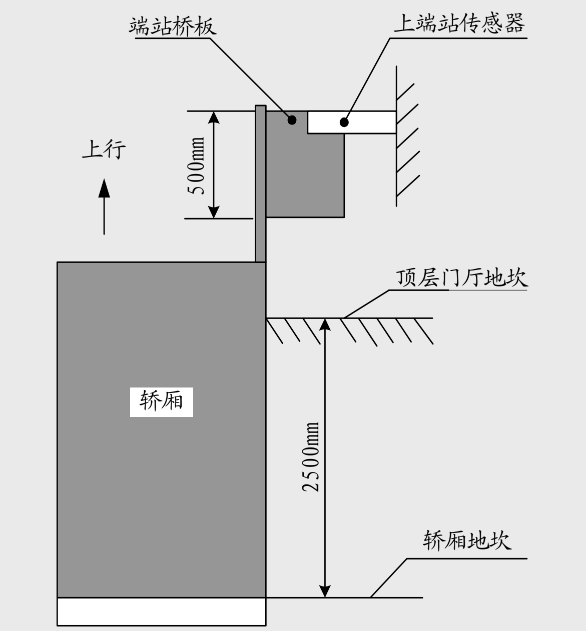


Diagram 4-3-3-2

Installation Diagram of The Upper Terminal switch

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

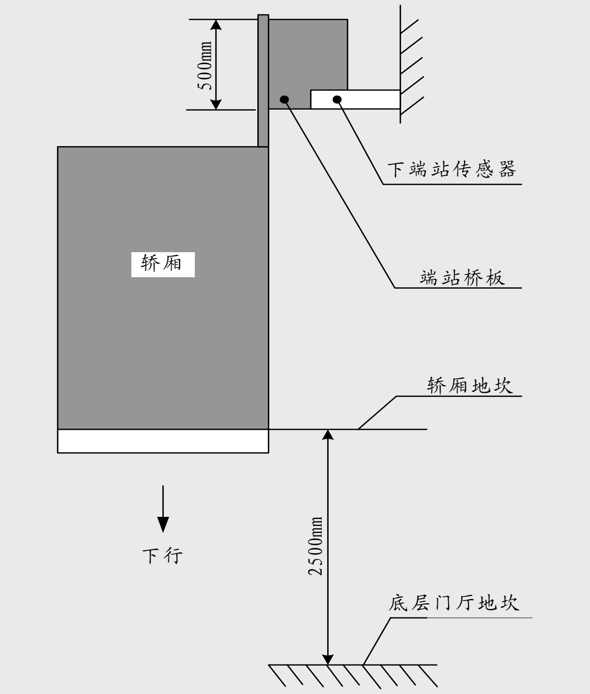


Diagram 4-3-3-3

Installation Diagram of The Lower Terminal switch

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

上行 up
端站桥板 bridge plate of the terminal
上端站传感器 sensor of upper terminal
顶层厅门地坎 landing door sill of the top floor
轿厢地坎 car sill
轿厢 car

下行 down
端站桥板 bridge plate of the terminal
下端站传感器 sensor of lower terminal
顶层厅门地坎 landing door sill of the bottom floor
轿厢地坎 car sill
轿厢 car

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

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

1.0m/s：the installation of terminal = the speed changing distance of the highest running speed set by main board ranges from 1 m to 1.5 m.

1.6～1.75m/s：

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

2. 0～4 m/s：

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

4.3.4. Grounding of the control system

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

1. Grounding the shielded wire of rotary encoder；

2. Grounding wire of hoistway wire and traveling cable；

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

4. Grounding the grounding terminals of other parts；

5. Pay attention to figure out the common, power grounding and external grounding.

Chapter 5 Parameter setup of BL2000 serial control system

5.1. General

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

1. Introduction of LCD and keyboard

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

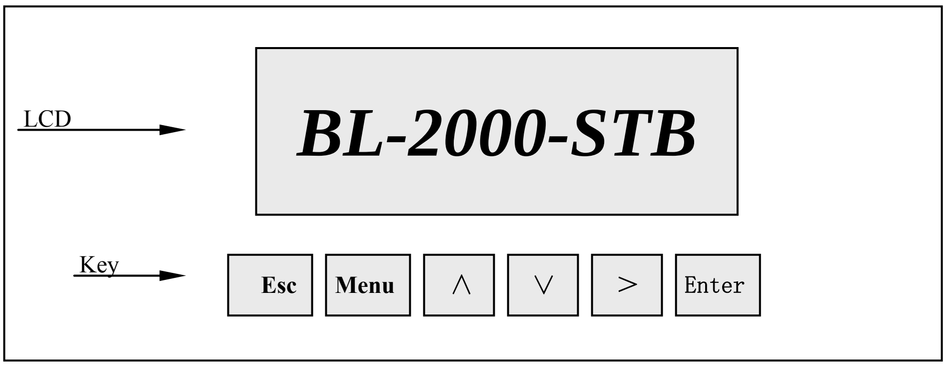


Diagram 5-1-1 Layout of LCD and key

Menu Menu key: return to main menu (excluding hoistway self learn, load inspection self learn and save parameter).

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

Esc Esc key: cancel and return to the previous menu.

＞ Cursor key: Circle move right; system enters into communication state by clicking it in main menu.

∧ Page up, increase 1 or select Yes (ON) key.

∨ Page down, decrease 1 or select No (OFF) key.

2. Setting and monitoring parameters

（**1**）Parameter setup: general parameter, running parameter and special parameter.

（**2**）Monitor elevator state: automation, inspection, attendant, fire and lock etc.

（**3**）Data monitor: hoistway position, elevator speed, I/O port, fault information, load, landing call, car call and communication etc.

（**4**）Hoistway self learn.

（**5**）Set new password.

5.2. Menu structure and flowchart

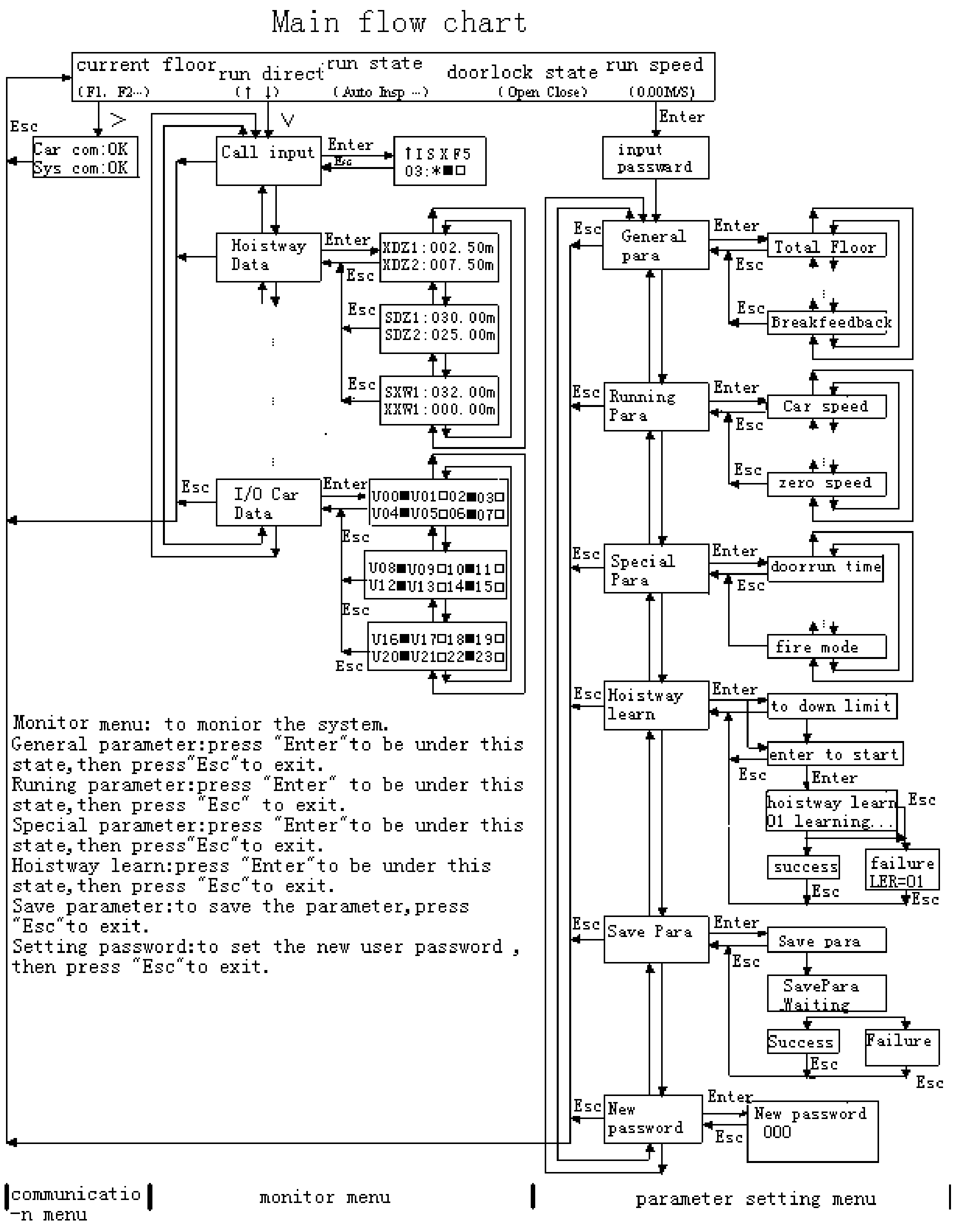
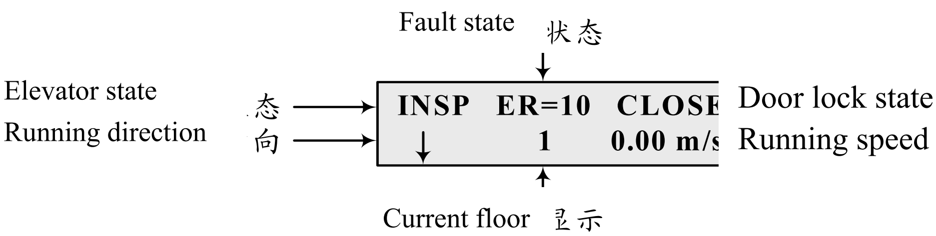


Diagram 5-2-1Main flowchart

5.2.1. Main menu

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



Elevator state:

INSP	inspection
MANU	attendant
AUTO	automation
FIRE	fire
STOP	stop
USER	special use

1. Fault state:

ER=#	fault
Blank	no fault

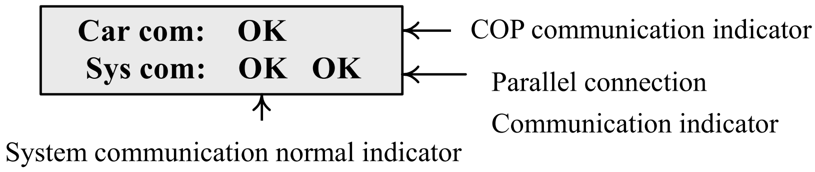
2. door lock state:

CLOSE	door close
OPEN	door open

3. Press Menu key to return main menu except it is in hoistway self learn, load inspection self learn and parameter saving.

5.2.2. Communication menu

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



Car board communication display:

OK communication is normal.

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

1. System communication display

OK communication is normal

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

2. Parallel communication display

OK communication normal

ET/ER communication error (select)

5.2.3. Password verify

Before you enter user menu and factory menu, set and save parameters, you must input right password in inspection state with the elevator on inspection state. User password may be modified in setting password menu, while factory menu can not be modified because it is set before the elevator is delivered. The concrete operations can refer to the following content.

5.2.4. Monitor menu and parameter setting menu

Monitor menu, general parameter, running parameter and special parameter are the basic interface for setting parameters and monitoring running state. Menu is divided into user menu and factory menu by user’s requirement.

1. User menu

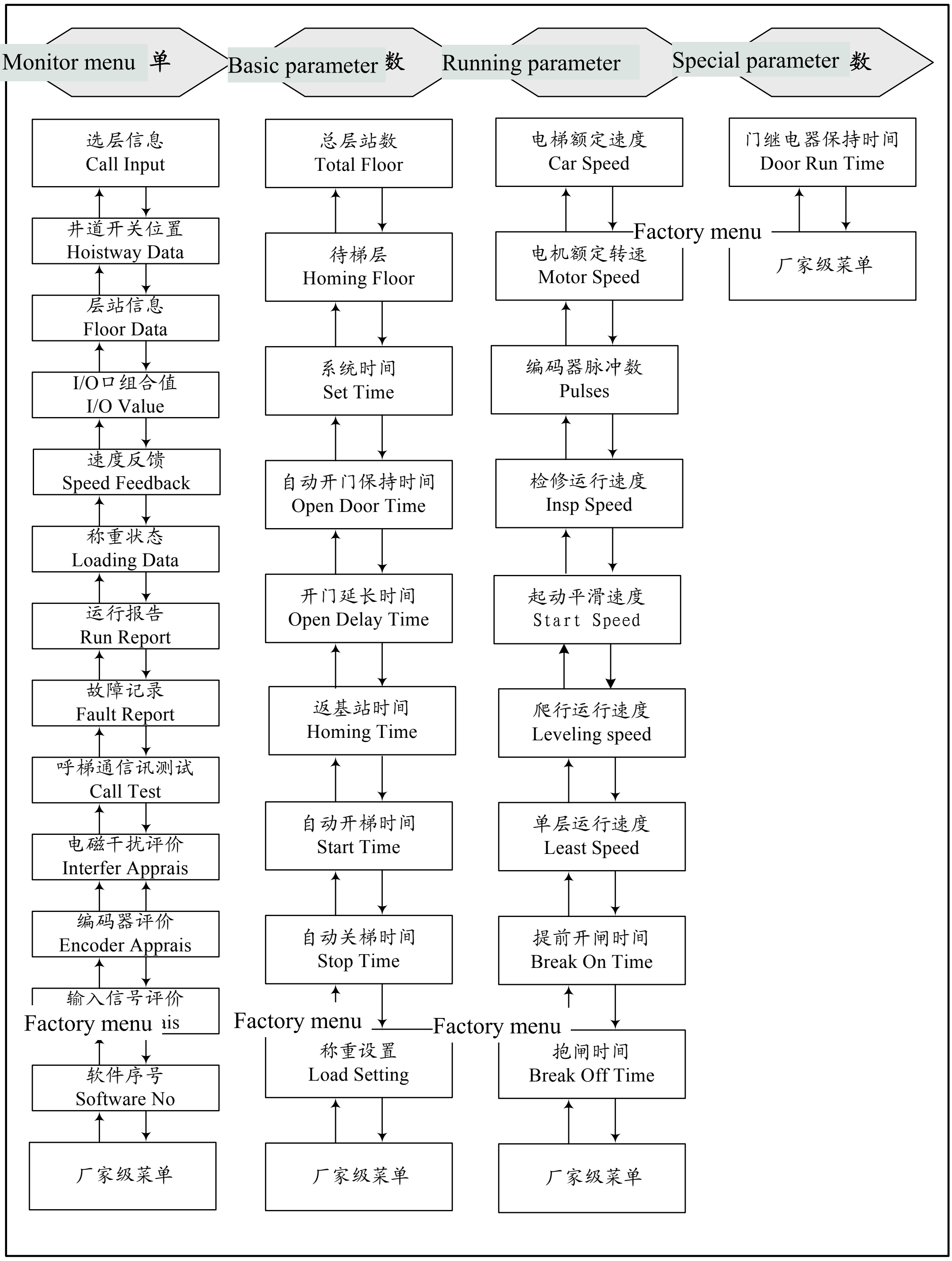


Diagram 5-2-4-1 User menu flowchart

2. Factory menu

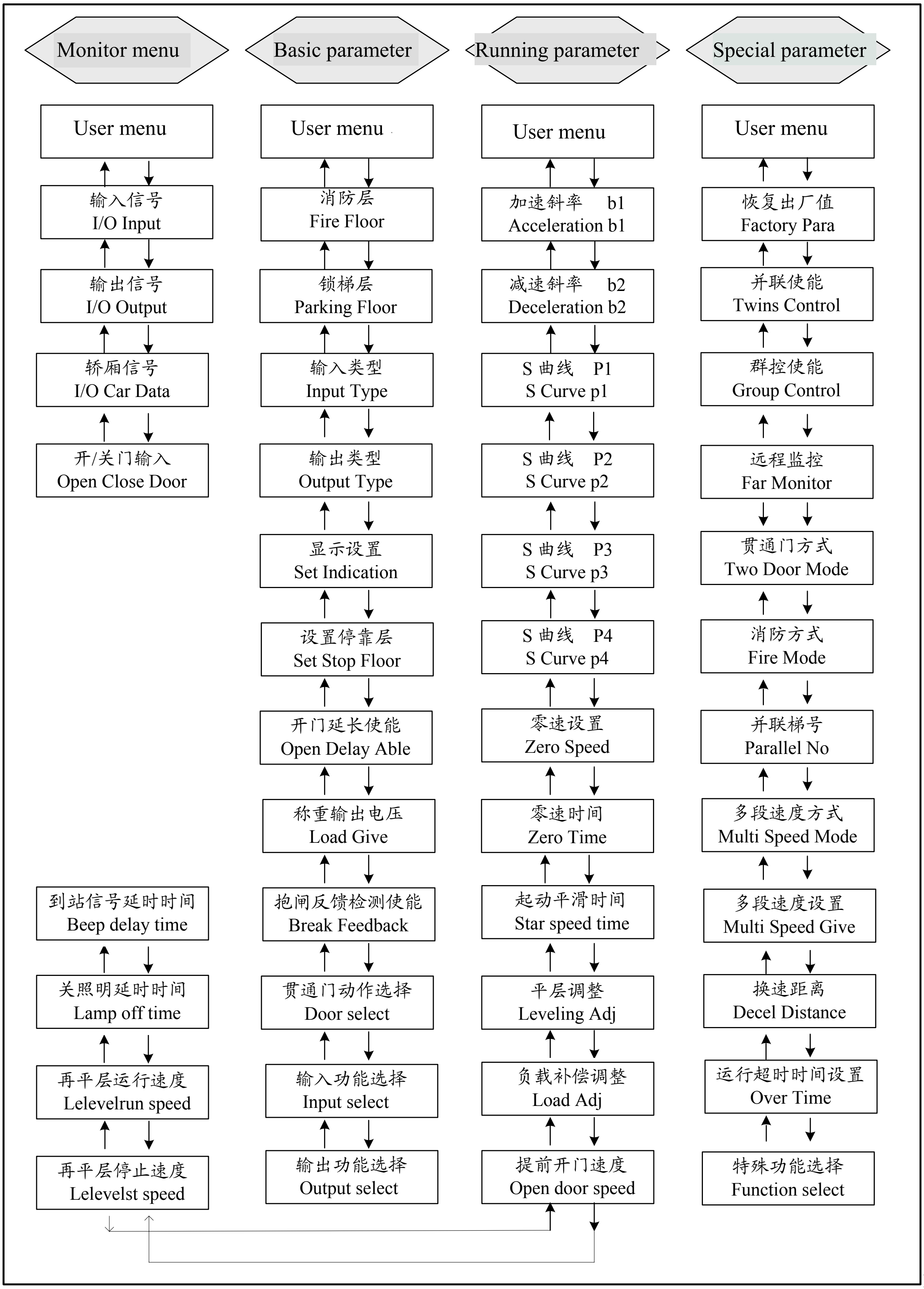


Diagram 5-2-4-2 Factory menu flowchart

5.2.5. Notice of menu setup

1. User menu are open to all users (it can be entered after the password is verified to be correct).
2. Factory menu are open to the user who have factory password.

3. When ‘enter’ is displayed on bottom right corner on LCD, you may click ‘enter’ key enter into sub-interface.

4. If there is no cursor, you can not set parameter. When you click ‘enter’ key and cursor is displayed, you can modify parameter by “∧" and “∨”, move cursor by “＞”..

5. Definitions of terms:

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

5.3. Setup and operation of monitor parameter menu

5.3.1. Monitor menu: all the interfaces are read only except floor select menu and close/open door menu

Table 5-3-1 Monitor parameter

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

5.3.2. Setup and operation

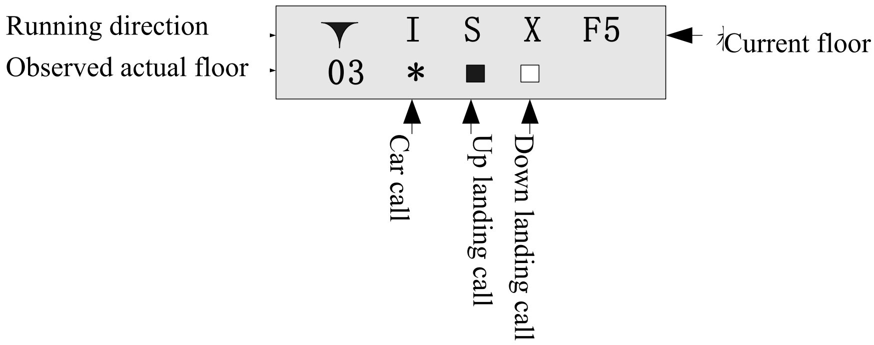
1. Call floor information

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

It will enter into the first page of monitor menu by striking '∨' key from main menu.

Call Input Enter
选层输入

(2) Press Enter key to enter select floor:



You may select observation floor by "∧" and "∨" in call information interface. "∧" and "∨" are current running direction. "*" twinkling represents car call. Click "enter" to select car call in adjustment. "□" represents no landing call, "■" represents up and down landing call. "F-XX" is current floor. It will return to main menu by click "esc".

2. Hoistway switch position

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

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

Hoistway Data Enter
井道数据

(2) press **Enter** to hoistway switch position interface:

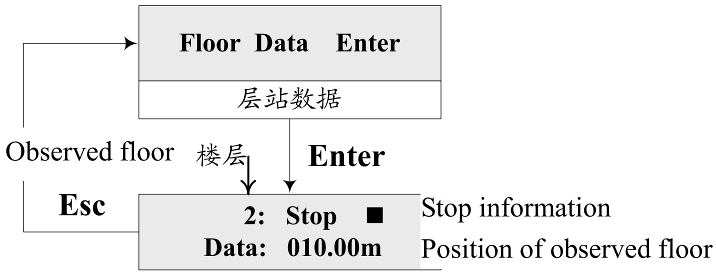
Up terminal station 1 →	XDZ1: 030.00 m
Up terminal station 2 →	XDZ2: 025.00 m
Down terminal station 1 →	XDZ1: 002.50 m
Down terminal station 2 →	XDZ2: 007.50 m

Up limit station 1 → XDZ1: 032.00 m
Down limit station 2 → XDZ2: 000.00 m

（3）Press ∧ and ∨ keys to change the observation item in hoistway switch position interface. Press Esc to return.

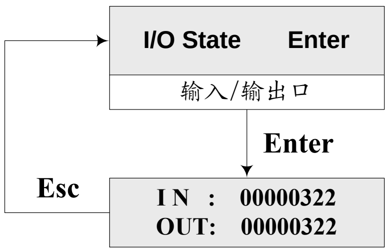
3. Floor information

The 1st line is stop information (□: not stop; ■: stop).
The 2nd line is actual position of floor. It starts from bottom limit.



4. I/O combination

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

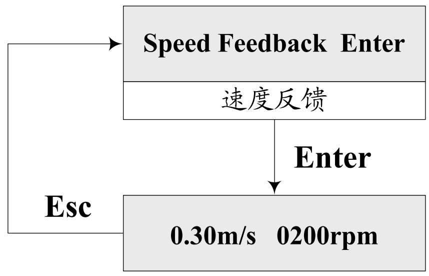


For example, decimal: IN = 00000322, OUT=00000322
binary: IN = 101000010, OUT=101000010

X0	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
0	1	0	0	0	0	1	0	1	0	0	0
X12	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**	**X20**	**X21**	**X22**	**X23**
0	0	0	0	0	0	0	0	0	0	0	0
Y0	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**	**Y11**
0	1	0	0	0	0	1	0	1	0	0	0
Y12	**Y13**	**Y14**	**Y15**	**Y16**							
0	0	0	0	0							

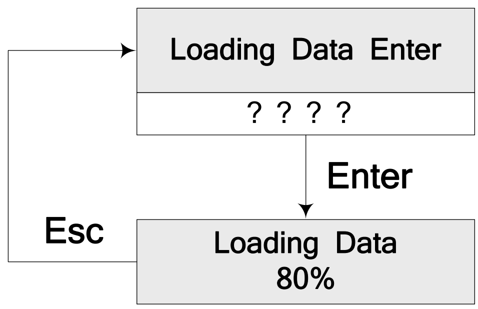
5. Speed feedback

It displays speeds of elevator and motor.



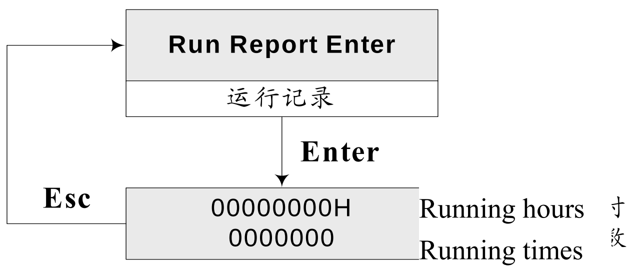
6. Load data

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



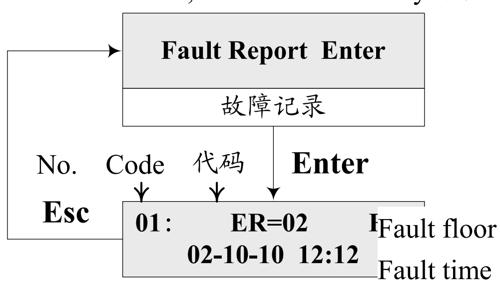
7. Running record

Accumulated time and times.



8. Fault record

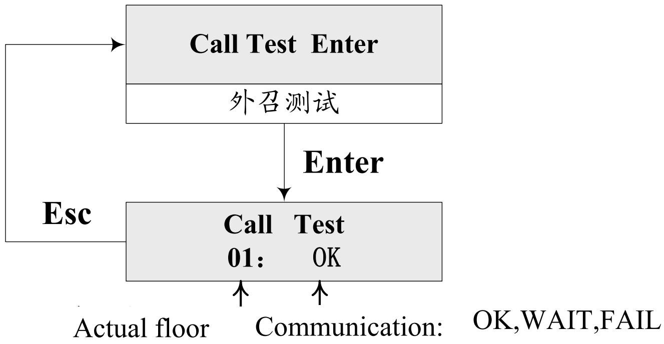
It records type and time of the latest 10 faults, which is selected by ‘∧’ and ‘∨.



9. Landing call communication test

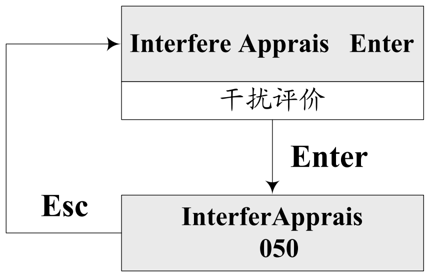
It checks communication among call and display board and main board.

- The number of landing call is selected by “∧” and “∨”.
- OK: normally communicate; Wait: testing (If the time is too long, check communication system); Fail: fail to communicate (check call and display board of the floor).



10. EMI evaluation

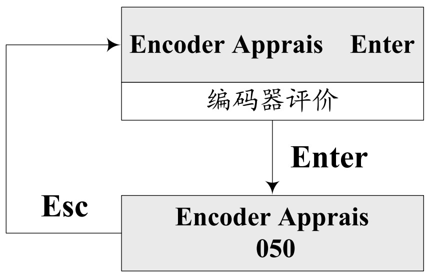
When elevator is debugged and running normally, EMI may be evaluated in this interface.



The data represents the intensity of EMI, “000” represents system is well connected to ground

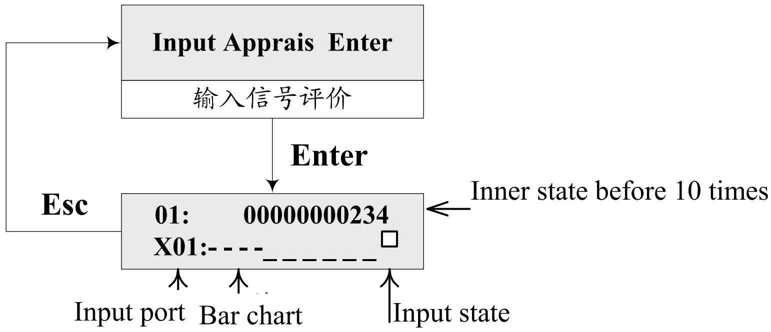
11. Coder evaluation

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



12. Input signal elevation

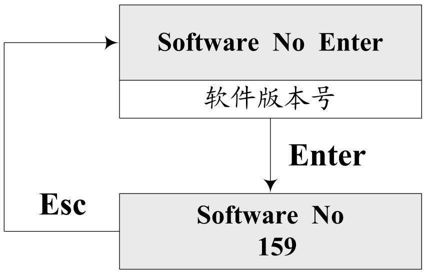
Observe input interference.



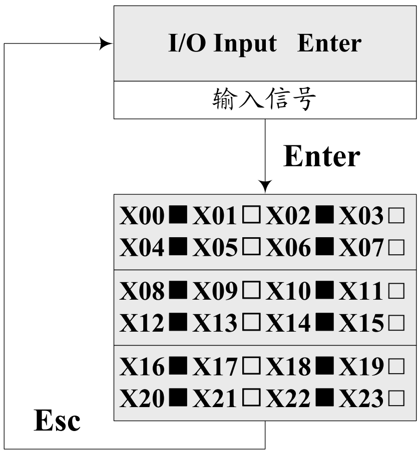
The heights of bars represent input port logic levels. High: 1, low: 0. If the quantity of 1 of input port in the bar chart is closer to that of 0, the interference is more intense.

13. Software version number

Software number when it is delivered.

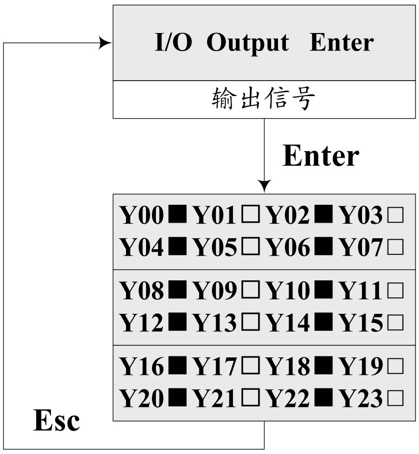


14. Input signal (point to point)



■: input 1; □: input 0. (□: light off, ■: light on)

15. Output signal (point to point)



■: Output 1 (relay act); □: output 0;

16. Car signal

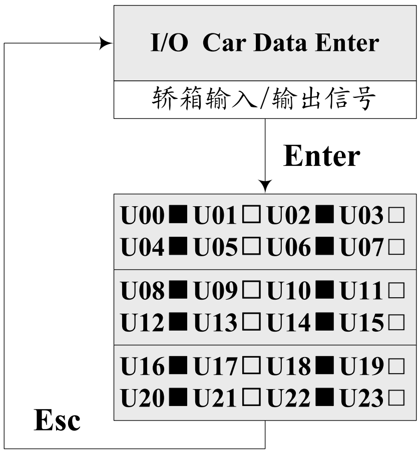
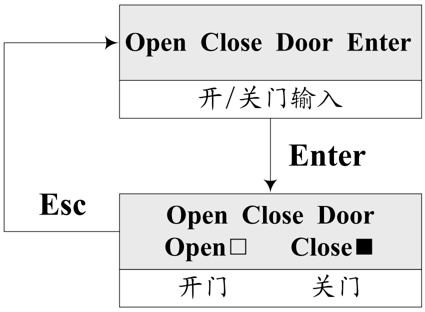


Table 5-3-2 (13) Car signal

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

	limit 2			U23	
U06	Close door limit 1	U13	Full load switch		

17. Open/close door input



Press ∧ or ∨ to enter open/close door. ■: valid of close door input. You may input “open” as the same.

5.4. General parameters menu setting and operation

5.4.1. General parameters list

Please refer to the list of 5-4-1 general parameters.

5.4.2. Setting and operation

1. Initial steps

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

Input Password Enter
输入密码

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

Password Error Enter
密码错误

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

General Para Enter
基本参数

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

Table 5-4-1 General parameters

Serial No.	Chinese	English	Factory Parameters	Range	Description
User menu					
1	总层站数	Total Floor	——	1～64	The total floor number(which is equal to bridge plate number within the door zone in the hoistway)
2	待梯层	Homing Floor	1*	1～total floor	The floor where elevator timely returns when there is no internal selection.
3	系统时间	System Time	——		To display and set the system time
4	自动开门保持时间	Open Door Time	3s*	0～999s	Open door time for an elevator under the automatic state
5	开门延长时间	Open Delay Time	30s*	0～999s	Open door time for an elevator under the automatic state (this parameter is available only when the open delay able is set **Yes.**).
6	返待梯层时间	Homing Time	60s*	0～999s	Homing time of an elevator when there is no external call or internal selection
7	自动开梯时间	Auto-start Time	00：00*		The elevator will start according to the set time. (electrical lock **ON**).
8	自动关梯时间	Auto-stop Time	00：00*		The elevator will stop according to the set time (electrical lock **ON**).
9	负载检测设置	Load Inspection Setting	NO		Set the load inspection YES/NO (it is only applicable to SJT-150 device)
Factory Menu					
10	消防层	Fire Floor	1*		Return floor for fire initial state
11	锁梯层	Parking Floor	1*		Return floor for electrical lock turn-off
12	输入接口有效电平设置	Input Interface Effective Electrical Level Setting	ON	Any floor	Inputting low electrical level (**ON**) or high level (**OFF**) ▲**Note：** Signal settings for upper, lower limit positions, etc.
13	输 出 继 电 器 触 点 类 型	Type of Output Relay Contact	OFF		The normally open point for output relay is set **OFF**, and the normally close point is set **ON.**
14	层站显示设置	Set Floor Indication	00～64		Set the display character of a certain floor
15	设置停靠层	Set Stop Floor	ON		Set if landing each floor is needed. (**ON** refers to landing， **OFF** refers to no landing)
16	开门延长使能	Open Delay Able	NO*		The function should be able to delay the door opening time. (optional)
17	负载检测输出电压	Load Inspection Output Voltage	0～10 V	-10～+10v	The range of load inspection compensation output voltage

18	抱闸反馈检测使能	Brake Feedback Inspection Able	Yes*		Select **Yes**, system will inspect the brake feedback. Select **No**, system won't inspect it.
19	贯通门动作选择	Rear opening Action Selection			Door action selection of landing floor (front door or rear door) .
20	输入功能选择	Input select		0～27	Output function selection of output ports of X26～X29
21	输出功能选择	Output select		0～19	Output function selection of output ports of Y16, Y17

1. The setting of total floor number

Set the total floor number of the elevator.

Total Floor 64
总楼层数

（**1**）Press **Enter** key**,** modify the total floor number when the number in lower right corner is blinking；
（**2**）After modification, press **Enter** key to finish;
（**3**）Press **Esc** key to cancel modification and restore to the original value；
（**4**）The total floor number should be equal to the bridge plate number within the door zone in the hoistway.

2. The setting of homing floor

The floor elevator returns (returns to the ground floor) when there is no external call or internal selection, the set method please refer to above mentioned one.

Homing Floor 1
待梯楼层

3. The setting of system time

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

Set Time 00-00-00 00:00
时间设置

4. The setting of open door time

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

Open Door Time 000s
开门保持时间

5. The setting of open delay time

Pressing the open delay time button (switch) under the automatic state could prolong the open delay time of an elevator. This function should be set or taken into effect only when the door open delay able is set **Yes.** The time unit for the open delay time is second.

Open Delay Time 000s
开门延长时间

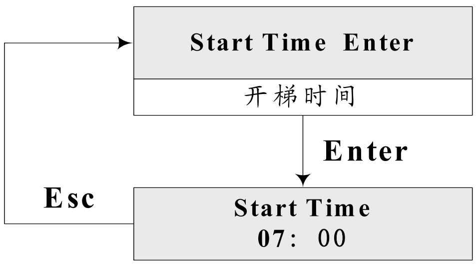
6. The setting of homing time

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

Homing Time 000s
返待梯层时间

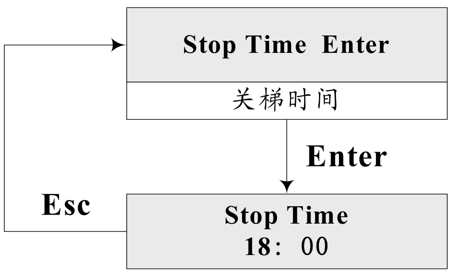
7. The setting of automatic start time

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



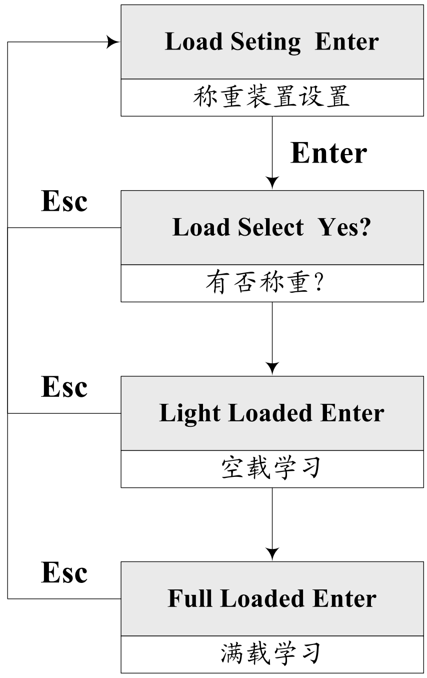
8. The setting of automatic stop time

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



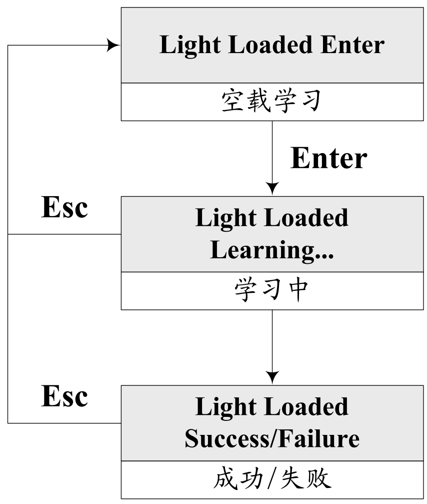
9. The setting of load inspection (this function is only applicable to the SJT-150 load inspection device)

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

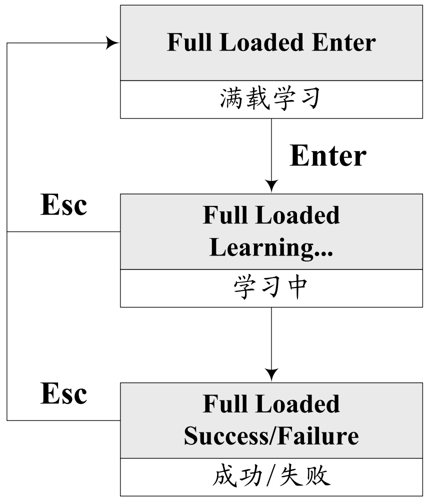


（**1**）Enter the load inspection **Yes/No** interface and then press **Enter** key, **Yes** or **No** will blink, press ∧ or ∨ key to select. Press **Enter** key after selection, or press **Esc** to cancel the selection. The light loaded or full loaded self-learning should be carried out only after selecting **Yes** and then pressing ∨ key**.**

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



（**3**）Full loaded self learning：Make the car full loaded and press "**OK"** key.



（4）**Wait** will be displayed during the self learning, please wait for a while; Display of **Success** means self learning is carried out successfully; Display of **Failure** means self learning fails.

（5）Notes

- ◆ Load inspection device is one of optional accessories in this system;
- ◆ It can produce light loaded, full loaded and overloaded alarm signal;
- ◆ It can output the analogue signal used for load compensation input of the frequency inverter.
- ◆ After load inspection self-learning, set compensation voltage degree and range according to the requirements of the frequency inverter.
- ◆ After load inspection self learning, if the current load condition is wondered, please check the load inspection status in the monitoring menu.
- ◆ If load inspection self learning fails, please check the load inspection device.
- ◆ Please refer to ***Instruction of SJT-150*** for details about load inspection device.
- ◆ When using the load inspection device manufactured by other companies through operation panel to input light loaded, full loaded and overloaded switch signals, please set Load select to be **No**, the system will directly confirm load switch signal input.

10. The setting of fire evacuation floor

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

Fire Floor 01
消防层设置

11. The setting of parking floor

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

Parking Floor 01
锁梯层设置

12. The setting of effective electrical level at the input port

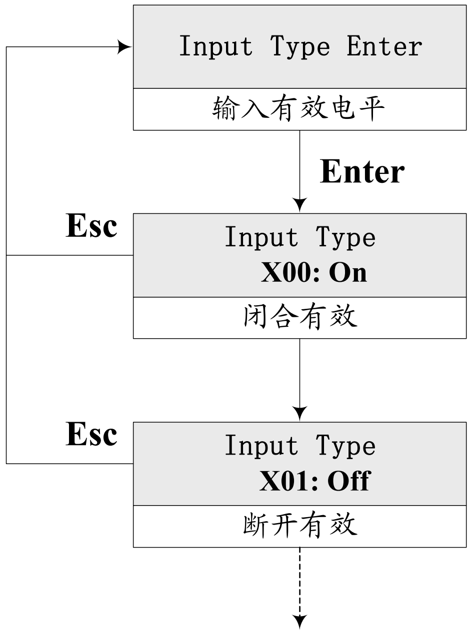


Table 5-4-2-The setting of effective electrical level at the input port

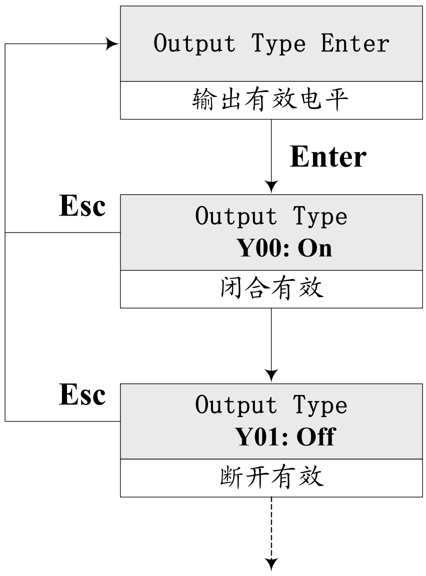
Name	Port No.	Location	Definition	Corresponding parameter	Default settings for input electrical level	External switch status	Normal status of the indicators
Main Control Board	X1	J1-2	Upward Input	X1	ON	Normally ON	OFF
	X2	J1-3	Downward Input	X2	ON	Normally ON	OFF
	X3	J1-4	Upper Station 2 Input	X3	OFF	Normally OFF	ON
	X4	J1-5	Lower Station 2 Input	X4	OFF	Normally OFF	ON
	X5	J1-6	▲Upper Limit Position Input	X5	ON	Normally OFF	ON
	X6	J1-7	▲Lower Limit Position Input	X6	ON	Normally OFF	ON
	X7	J1-8	Upper Station 1 Input	X7	OFF	Normally OFF	ON
	X8	J1-9	Lower Station 1 Input	X8	OFF	Normally OFF	ON
	X9	J1-10	Upper Leveling Input	X9	ON	Normally ON	OFF
	X10	J2-1	Lower Leveling Input	X10	ON	Normally ON	OFF
	X11	J2-2	Frequency Inverter Fault Input	X11	ON	Normally ON	OFF
	X12	J2-3	Fire Input	X12	ON	Normally ON	OFF
	X13	J2-4	Emergency Stop Input	X13	ON	Normally ON	OFF
	X14	J2-5	Door Interlock Input	X14	ON	Normally ON	OFF
	X15	J2-6	*Brake Feedback Input /Main Power Supply Connector Input	X15	ON	Normally ON	OFF
	X16	J2-7	Auxiliary Connector Input	X16	ON	Normally ON	OFF
	X17	J2-8	Brake Connector Feedback Input	X17	ON	Normally ON	OFF
	X18	J2-9	Emergency Automatic leveling Input	X18	ON	Normally ON	OFF
	X19	J2-10	Frequency Inverter Operation Input	X19	ON	Normally ON	OFF

	X20	J3-1	Electrical Input	X20	ON	Normally ON	OFF
	X21	J3-2	Thermo-switch Input	X21	ON	Normally ON	OFF
	X22	J5-1	Emergency Stop Input+	X22	ON	Normally ON	OFF
	X23	J5-2	Emergency Stop Input				
	X24	J5-3	Door Interlock Input +	X23	ON	Normally ON	OFF
	X25	J5-4	Door Interlock Input -				
Display Board in the car	KMV1	J9-2	Door Open Limit Position 1 Input	U07	ON	Normally ON	OFF
	GMV1	J9-3	Door Close Limit Position 1 Input	U06	ON	Normally ON	OFF
	KAB1	J9-4	Safety Edge 1 Input	U18	ON	Normally ON	OFF
	CZ	J9-5	Overloaded Input	U15	ON	Normally ON	OFF
	MZ	J9-6	Full Loaded Input	U13	ON	Normally ON	OFF
	KAB2	J9-7	Safety Edge 2 Input	U17	ON	Normally ON	OFF
	QZ	J9-8	Light Loaded Input	U14	ON	Normally ON	OFF
	KZ	J9-9	No load Input	U16		Normally ON	
	SZH	J9-10	Manual Input	U10		Normally ON	
	KMV2	J10-5	Door Open Limit Position 2 Input	U05	ON	Normally ON	OFF
	GMV2	J10-6	Door Close Limit Position 2 Input	U04	ON	Normally ON	OFF
	SZY	J10-1	Special Input	U08		Normally ON	
	SZS	J10-2	Direct Drive Input	U12		Normally ON	
	ZHS	J10-3	Manual Orientation Up	无		Normally ON	
	ZHX	J10-4	Manual Orientation Down	无		Normally ON	

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

13. The setting of output relay contact type

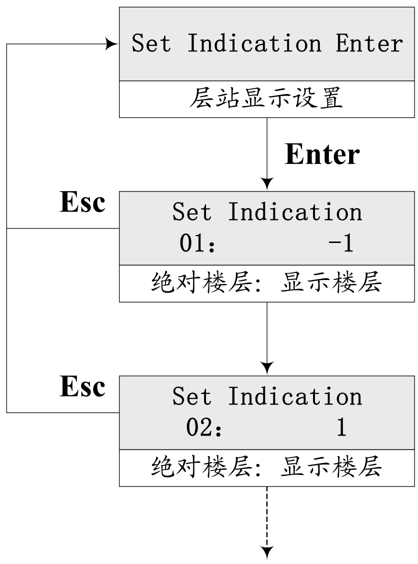
The normally open and close contacts of the output relay are respectively set **ON** and **OFF**, the factory parameter is set **ON**.



▲Note: When the output relay Y12 uses Fuji frequency inverter, the able signal should be set OFF.

14. The setting of floor indication

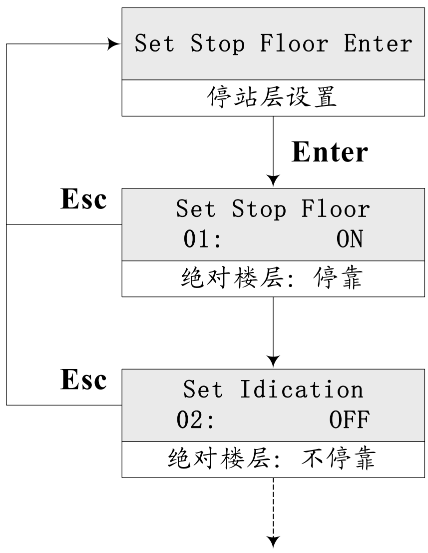
Set the displayed symbol (to indicate the floor) for each floor in the building, it can be English letters or numbers with symbols.



The display setting in the general parameter could set the third position as the display setting position, the second position as numbers, letters and symbols. Only the following capital letters could be set at the third position, ABCDEFGHIJKLMNO. If two positions are only needed, please set the initial two positions, and the third one is set vacant; (The function for displaying the third position should match with the program of the call board, or all the three positions could not be displayed.)

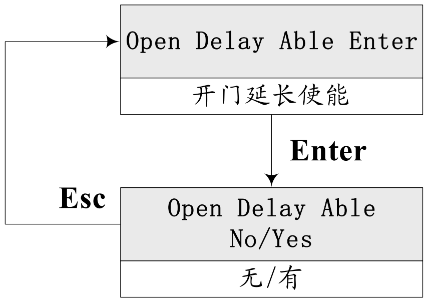
15. The setting of stop floor

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



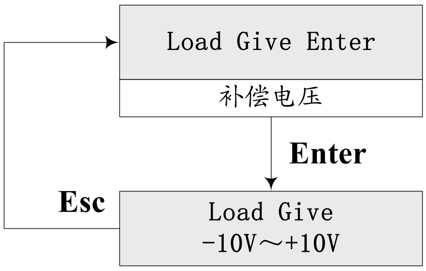
16. The setting of open delay able

Door open delay time is effective. (Optional)

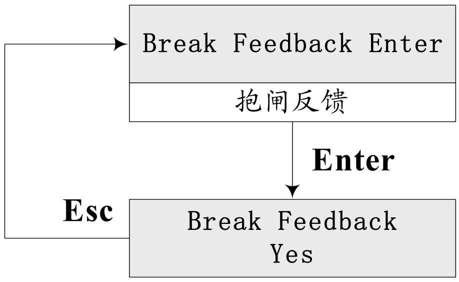


17. The setting of load inspection output voltage

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



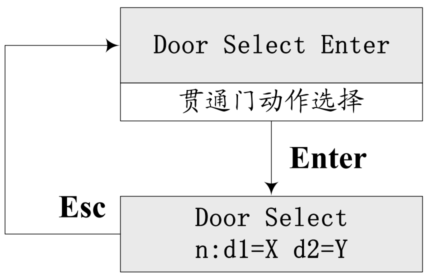
18. The setting of brake feedback inspection able



（1）Select **Yes,** the system will inspect brake feedback. Select **No,** the system will not inspect it.

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

19. The setting of rear opening action selection



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

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

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

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

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

The program should be set as followings:

```
Door Select
6:d1=Y d2=N
```

```
Door Select
7:d1=Y d2=Y
```

20. Input select

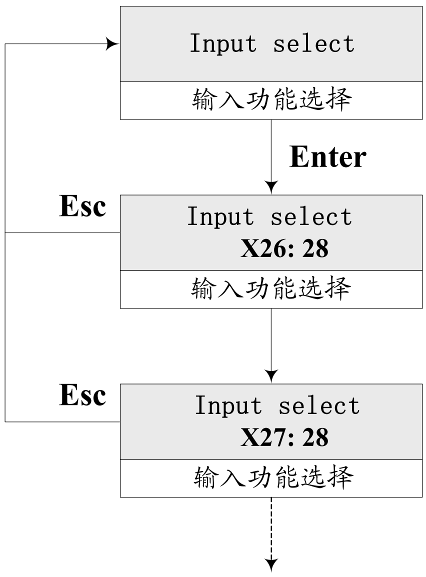


Table 5-4-3-The setting of input functions

Function No.	Signification	Function No.	Signification
0	Maintenance Input	16	Auxiliary Contactor Input
1	Upward Input	17	Brake Feedback Input
2	Downward Input	18	Emergency Run Input
3	Null Input	19	Frequency Inverter Run Input
4	Null Input	20	Electrical Lock Input
5	Upper Limit Position Input	21	Thermo-switch Input
6	Lower Limit Position Input	22	Null Input
7	Null Input	23	Null Input
8	Null Input	24	Null Input
9	Null Input	25	Null Input
10	Null Input	26	Re-leveling Requirements Satisfied Input
11	Frequency Inverter Fault Input	27	Re-leveling Door Zone Input
12	Fire Input	28	Backup Input
13	Emergency Stop 1 Input		
14	Door Interlock 1 Input		
15	Main Power Supply Contactor Input		

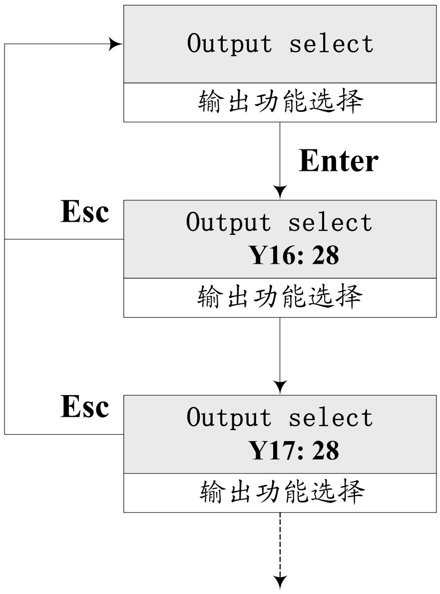
Input ports of X26, X27, X28, X29 have multifunctional input functions. Setting the corresponding function numbers, X26, X27, X28, X29 could replace partial functions of X0~X21 inputs;

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

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

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

21. Output select



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

Table 5-4-3-Output set

Function No.	**Definition**	**Function No.**	**The default setting of input electrical level**
0	Re-leveling Output	8	Main Contactor Control Output
1	Fire Linkage Output	9	Auxiliary Contactor Control Output
2	Door Open 2 Contactor Control Output	10	Frequency Inverter Upward Control Output
3	Door Close 2 Contactor Control Output	11	Frequency Inverter Downward Control Output
4	Door Open 1 Contactor Control Output	12	Frequency Inverter Able Control Output

5	Door Close 1 Contactor Control Output	13	Multi Speed Command 1 Control Output
6	Brake Control Output	14	Multi Speed Command 2 Control Output
7	Economical Type Resistance Control Input	15	Multi Speed Command 3 Control Output

- The range of ports with multifunctional output setting function: from Y0 to Y15;
- The setting method of multifunctional output is the same as "multifunctional input setting".

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

5.5. The setting and operation of run parameter menu

5.5.1. Table of run parameter

Table 5-5-1 Table of run parameter

Serial No.	Chinese	English	Factory Data	Range	Description
			Customer Menu		
1	△电梯额定速度	Car Rated Speed	1.6m/s	1～2.5m/s	Car speed under the rated rotation speed of the motor
2	△电机额定转速	Motor Rated Speed	——	1～9999r	Motor Speed
3	△编码器脉冲数	Pulses of Encoder	——	500～9999	Every rotation pulse of the encoder the main computer board received
4	检修运行速度	Insp Speed	0.3m/s*	0.01～0.6m/s	Inspection Speed
5	起动平滑速度	Start Speed	0.00m/s *	0～0.20m/s	The incremental smooth speed prior to the start curve
6	自救运行速度	Leveling Speed	0.3m/s*	0.01～0.6m/s	Leveling Speed
7	单层运行速度	Least Speed	1m/s*	0.01～1.0m/s	Stable value in the least speed curve
8	提前开闸时间	Break On Time	500ms*	10～9990ms	The interval time between brake on and running curve
9	抱闸时间	Break Off Time	500ms*	10～9990ms	The interval time between brake and door automatic open
			Factory Menu		
10	b1	Acceleration b1	0.6*	0.1～ 9.99	Accelerating gradient
11	b2	Deceleration b2	0.6*	0.1～ 9.99	Decelerating gradient
12	P1	S Curve P1	0.7*	0.1～ 9.99	S time 1
13	P2	S Curve P2	0.7*	0.1～ 9.99	S time 2

14	P3	S Curve P3	0.7*	0.1～ 9.99	S time 3
15	P4	S Curve P4	0.7*	0.1～ 9.99	S time 4
16	零速设置	Zero Speed Setting	5rpm*	0～ 9999	Threshold value of zero speed
17	零速时间	Zero Speed Time	210ms	0~999ms	The delay brake time after the system detected the zero speed
18	起动平滑时间	Start Speed Time	0	0~9000ms	Duration of start speed time
19	平层调整	Leveling Adj	50mm		Adjust the difference upward/downward leveling
20	负载补偿调整	Load Compensation Adj	0	0~12	Adjust load compensation output voltage according to the floor
21	提前开门速度	Open Door Speed	0.15	0~0.3m/s	Open door speed of an elevator
22	再平层停止速度	Relevel Stop Speed	0.30	0~0.3m/s	In the process of door open or re-leveling, if the speed is higher than door open speed or re-leveling speed, the elevator will stop running.
23	再平层运行速度	Re-leveling Run speed	0.06	0~0.3m/s	Re-leveling run speed is set during the given simulation
24	关照明延时时间	Lamp off time	15	0~599m	Lamp off time
25	到站信号延时时间	Beep delay time	100	0~9990ms	Beep delay time

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

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

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

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

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

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

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

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

Runing Para Enter
运行参数

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

1. The setting of car rated speed

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

Note：The car rated speed is used to indicate its proportional relation with car speed at the motor rated rotary speed. Changing this parameter could not change the actual running speed of the elevator.

Car Speed 1.6 m/s
电梯额定速度

2. The setting of rated motor speed

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

Motor Speed 1470 rpm
电机额定转速

3. The setting of pulses of encoder

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

Pulses 1024 PPR
编码器每转脉冲数

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

4. Inspection speed

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

Insp Speed 0.30 m/s
检修运行速度

5. The setting of start speed

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

Start Speed 0.00 m/s
启动平滑速度

6. The setting of leveling speed

When the elevator stops in the non door zone due to some faults, if the elevator is in the safe loop, after the frequency inverter returns to the normal state, the elevator could automatically level (levels to the door zone).This interface should be used to set leveling speed within the range from **0.01 m/s** to **0.6m/s**.

Leveling Speed 0.30 m/s
自救运行速度

7. The setting of least speed

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

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

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

Least Speed 1.00 m/s
单层运行速度

8. The setting of brake on time

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

Break On Time 50 ms
提前开闸时间

9. The setting of brake off time

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

Break Off Time 50 ms
抱闸时间

10. The setting of accelerating gradient b1

Acceleration b1 0.6 m/s2
加速斜率**b1**

11．The setting of decelerating gradient b2

Deceleration b2 0.6m/s²
减速斜率b2

12．S Time 1-The setting of P1

S Curve P1 0.6 m/s2
S曲线**P1**

13．S Time 2-The setting of P2

S Curve P2 0.6 m/s2
S曲线**P2**

14．S Time 3-The setting of P3

S Curve P3 0.6 m/s2
S曲线**P3**

15．S Time 4-The setting of P4

S Curve P4 0.6 m/s2
S曲线**P4**

▲Note:

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

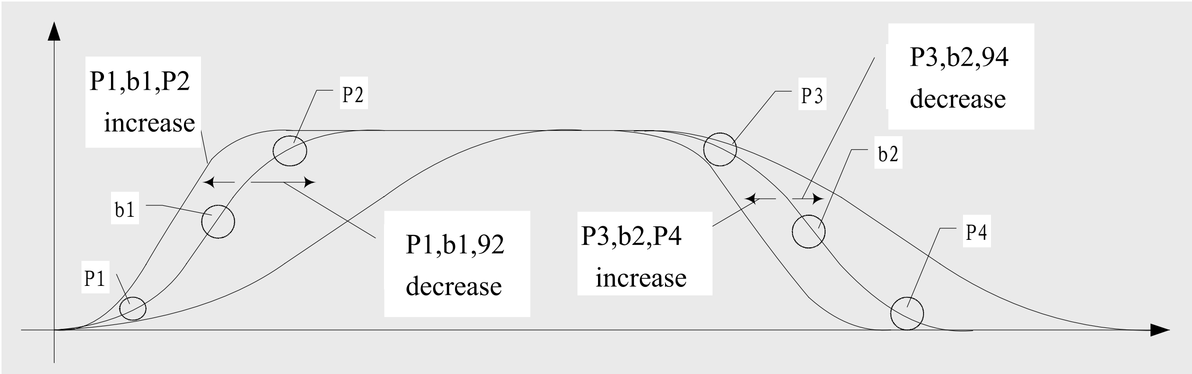


Table 5-5-1-9 The diagram of speed curve parameter adjustment

◇ Increase the parameter value, the corresponding part of the curve gets steeper; Decrease the parameter value, the corresponding part of the curve gets flatter; Appropriate adjusting above six curves parameter could acquire better comfort degree and satisfy some relevant provisions in the clauses of the elevator standard.

16. The setting of zero speed

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

Zero Speed 0005 rpm
零速设置: 5转/分

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

17. Zero speed time

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

Zero Time 210ms
零速时间

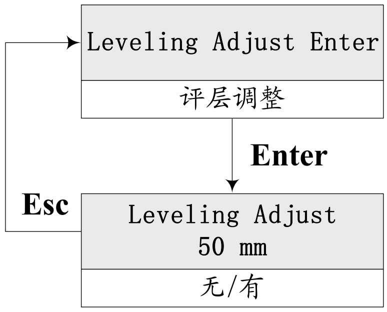
18. Start speed time

Duration for the start speed.

Star speed time
起动平滑时间

19．Leveling adjustment

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



20．Load compensation adjustment

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

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

2. Run the no load elevator to the top floor；
3. Set the compensation output voltage between—8V to +8V (smaller than±8 volt for the tolerance of adjustment）；
4. Adjust the simulating load compensation gain of the frequency inverter and make the car not slide when the car runs downwards, the gain at this time is the reasonable value;
5. Run the no load elevator to the bottom floor，increase the load compensation adjustment parameter and make the car not slide when the car runs upwards from the bottom floor, the parameter at this time is the reasonable value;
6. Save the system parameter.

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

21．Open door speed

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

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

Open door speed
提前开门速度

22．Re-leveling stop speed

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

Relevelst speed
再平层停止速度

23．Re-leveling run speed

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

Relevelrun speed
再平层运行速度

24．Lamp off time

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

Lamp off time
关照明延时时间

25．Beep delay time

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

Beep delay time
到站信号延时时间

5.6. The setting and operation of special parameters menu

5.6.1. Special parameter table

Table 5-6-1 Special Parameter Table

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

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

a) **Note：The factory parameters with * symbols could be initiated, after being restored to the factory parameter, these parameter could be restored.**

5.6.2. Setting and operation

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

Special Para Enter
特殊参数

1. The setting of Open/Close Door Run Time

（1）After sending the command of door opening or closing, set the lasting time of this command;

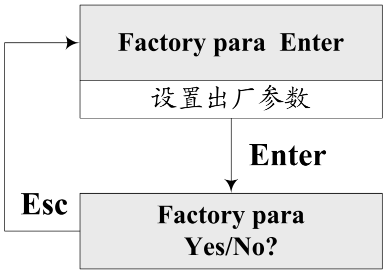
（2）When there is no door open or close limit position in the door machine system, set the open/close door run time in this interface;

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

Door Run Time 005 s
开/关门运行时间

2. Restore to the factory parameter

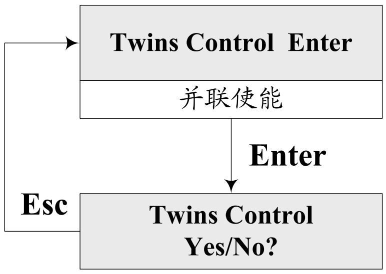
Restore to the set factory parameter.



Select Yes and the parameters will be restored to the factory parameters. When the system debugging parameter setting is disordered and needed to be reset, this function should be applied.

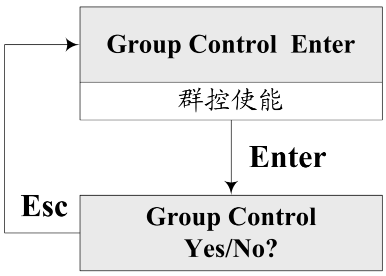
3. The setting of duplex able

Yes：duplex run, **No**：single elevator run



4. The setting of group control able

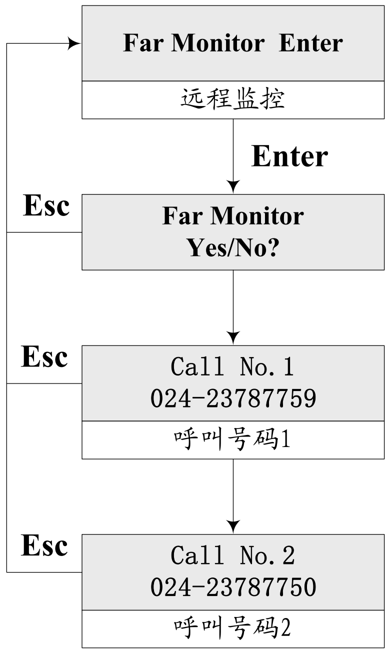
Yes：group control run，**No**：single elevator run (only if the customer requires the factory to provide this function, setting group control is effective) .



5. The setting of remote monitoring

Yes：with the function of remote monitoring,

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

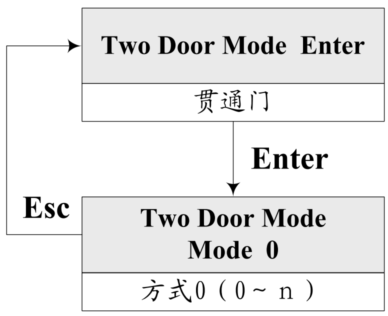


The calling number can only be set if the function of remote monitoring is set **Yes**. If there is something wrong with the elevator, the system will automatically call the set telephone number. Remote monitoring could call two telephone numbers to the maximum.

6. Rear opening mode

(1) Mode selection

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



n=0：non rear opening mode

n=1：rear opening mode 1，there is only one door open for each floor.

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

n=3：rear opening mode 3，there are two door open for the floor(s), when the car runs to the through floor, both the two door will open simultaneously. (There is only one set of internal selective buttons in the car, and external calling address is set as the mode 2.)

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

n=5：rear opening mode 5，there are two door open for the floor(s), when the car normally runs to the through floor, the car door will open according to commands. For example, when parking, if there is any internal selection or external call for the front door, the front door will open; or there is any internal selection or external call for the rear door, the rear door will open; if there are some internal selections or external calls for both the front and rear doors, both the two doors will open simultaneously. (There is one set of internal input buttons both on the front and rear doors.)

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

(**2**) The setting of external call board address

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

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

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

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

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

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

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

◆ The connection of car internal selective buttons:

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

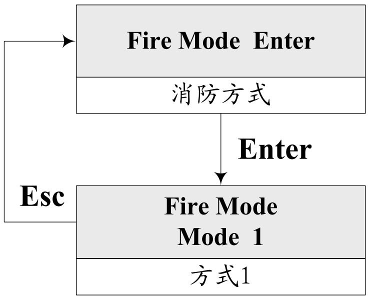
◇ When setting the rear opening mode of main control board as **2, 4, 5**: set the total floor number as N, thus car internal selective ports on **1～N** floor correspond to internal selective press buttons of the actuating front door, 1 corresponds to the bottom floor, N corresponds to the top floor.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

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

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

7. The setting of fire mode

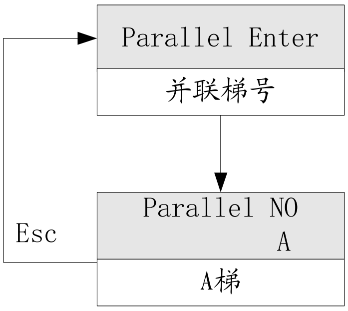
When setting the fire mode as 1, the elevator only has the function of fire emergency travel.



▲Note: When selecting fire mode 0, please pay attention to checking if the external fire equipments meet the national standards or not, or some unexpected bad results will occur.

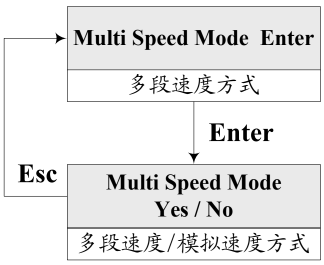
8. The setting of duplex elevators No.

When the duplex able is set **Yes**，the duplex elevators number should be set as **A** or **B**. The setting interface is as following:



9. The setting of multi speeds modes

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



10. The setting of multi speeds

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

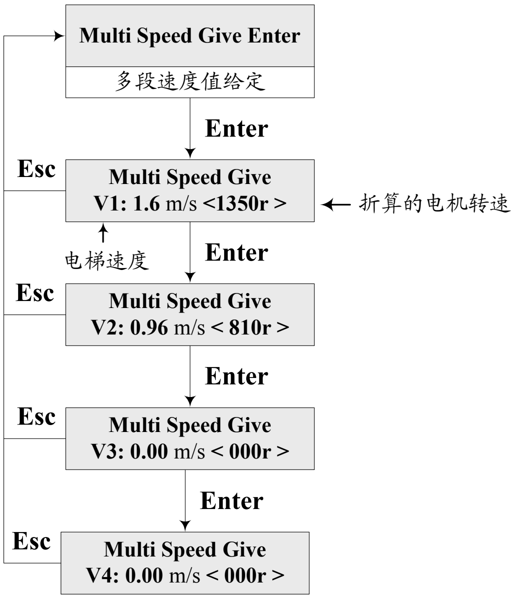
Table 5-6-2-1 The setting of multi speeds values

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

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

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

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



◆ **Multi speeds command output logic**

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

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

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

◆ **The examples of multi speeds output**

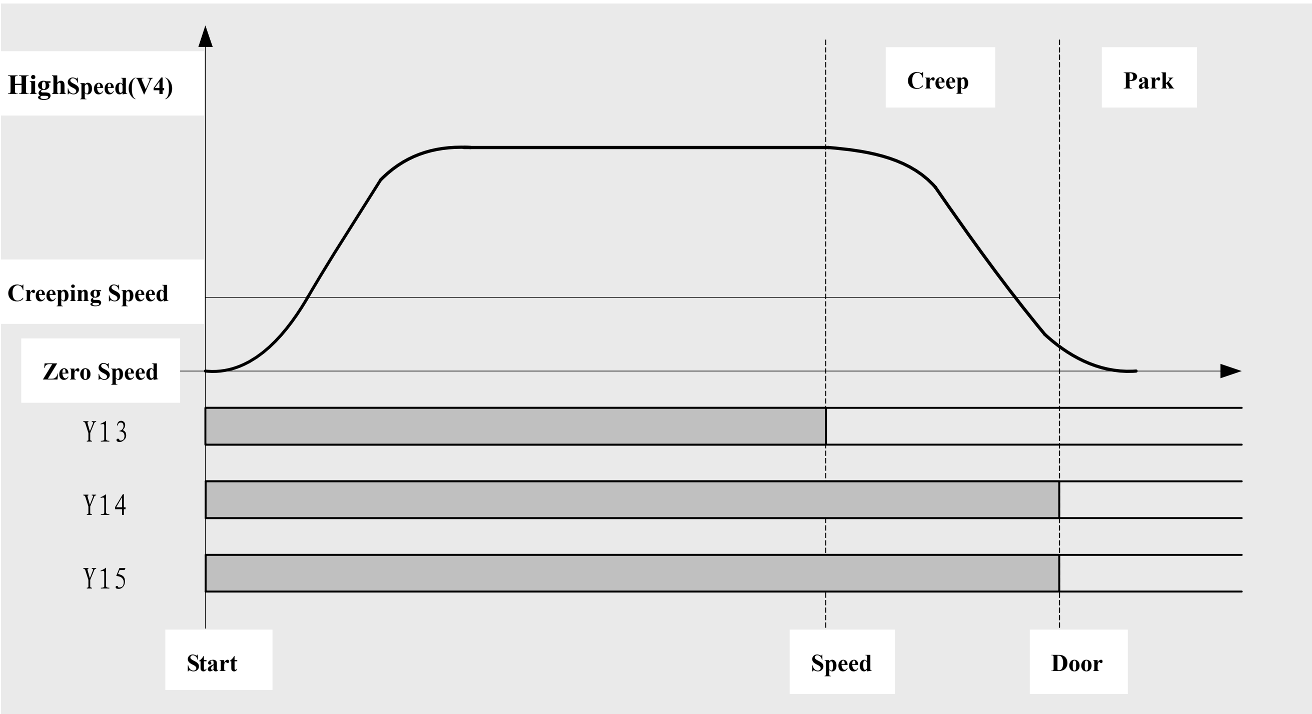
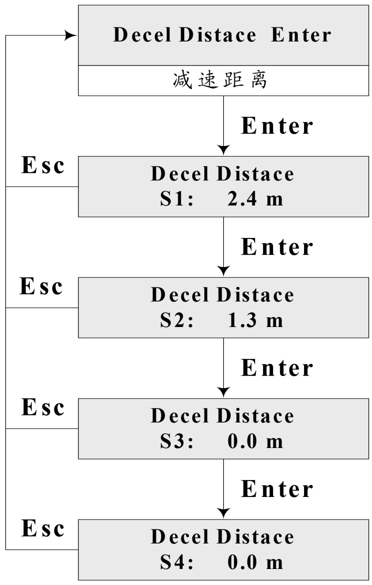


Table 5-6-2-6 (5) The diagram of multi speeds output

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

11. The setting of decelerating distance



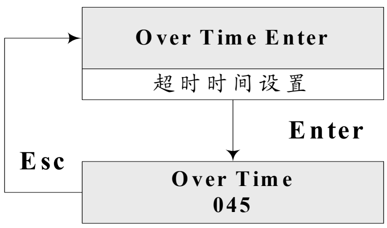
In the multi speed modes, regulating the decelerating distance of multi speeds could prevent the elevator from braking at non zero speed or overlong creeping distance. The decelerating distances which correspond to different speeds are different, which are need to be tested and set when debugging. Only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

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

12. The setting of overtime run

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

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



13. The setting of special functions selection

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

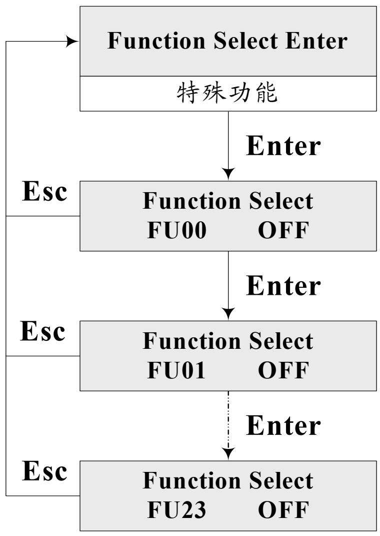


Table 5-6-2-3 The setting of special functions selection

Function No	Function Description
FU00	After the elevator levels and stops, take the current floor as the benchmark, if there is no external and internal selection registration on the floors above the original running direction, cancel all the internal registrations.
FU01	It is used for internal test.
FU02	The elevator runs to the creeping area after changing speed, if it reaches the two doors zone, the frequency inverter speed must be changed to 0, or the default setting is that if the elevator reaches single door zone, the frequency inverter speed must be changed to 0.
FU03	It is used for internal test.
FU09	If **ON** is set：the internal selection could be cancelled during the running; If **OFF** is set：the internal selection cannot be cancelled during the running.
FU10	If **ON** is set：brake instantly when the run feedback of the transducer becomes effective；If **OFF** is set：brake 0.5 second later after the run feedback of the transducer becomes effective. It is set **ON**, when SIEI frequency inverter with multi speeds is used.
FU11	If **ON** is set: multi speeds logics of KEB F4 frequency inverter will be output;
FU12	If **ON** is set：able, direction and speed are given simultaneously (when SIEI or KEB F4 frequency inverter with multi speeds is used) ；If **OFF** is set：please set it as **OFF,** when SIEI or KEB F4 frequency inverter with multi speeds is not used)
FU13	If **ON** is set：the direction becomes invalid when parking, the elevator will brake at the zero speed (when SIEI frequency inverter with multi speeds is used)；If **OFF** is set: able and direction become invalid simultaneously.
FU14	ON：actuate the functions for disable people used；OFF：without disable people used function
FU16	ON：system should make sure that door close limit position is valid when door lock is closed, OFF：door lock state has nothing to do with the door close limit position.
FU17	ON：able direction and brake become invalid simultaneously when the elevator stops due to the maintenance，OFF：After braking, the able direction will become invalid 0.5 second later when the elevator stops due to the maintenance.
FU18	ON：only install one set of press button for close and open of the door when there is the rear opening；OFF：two sets of press buttons for close and open of the door when there is the rear opening；
FU19	ON：door open re-levelling able；OFF：without the re-levelling function.
FU20	ON：advance door open able；OFF：without the advance door open function.

FU21	ON：door won't open at non door zone position when the elevator is under the maintenance state；OFF：door will open at any position when the elevator is under the maintenance state.
FU22	ON：the hardware edition of main board is high than BL2000—STB-V9 (X26, X27, X28, X29 input and Y16, Y17 output could be used) ；OFF：the hardware edition of main board is BL2000—STB-V2 (the newly added input and output ports cannot be used) .
FU23	FU23=ON：the serial weighing apparatus which match with the main board use SJT-300 of CAN bus mode, FU23=OFF：The serial weighing apparatus which matches with the main board uses SJT-150 of 485 bus mode.
FU24	ON：when the speed is less than 2m/sec , second terminal landing input is used(for the elevator with running speed 1.75m/sec, the two-level enforced changing device should be equipped);OFF：for the elevator with running speed less than 2m/sec, the second terminal landing input can not beused.
FU25	ON：the terminal landing only proof the floor number and calibration; OFF：When multi-segment given, because of the too large allowance in the terminal landing proofing, ER14 protection occurs.

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

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

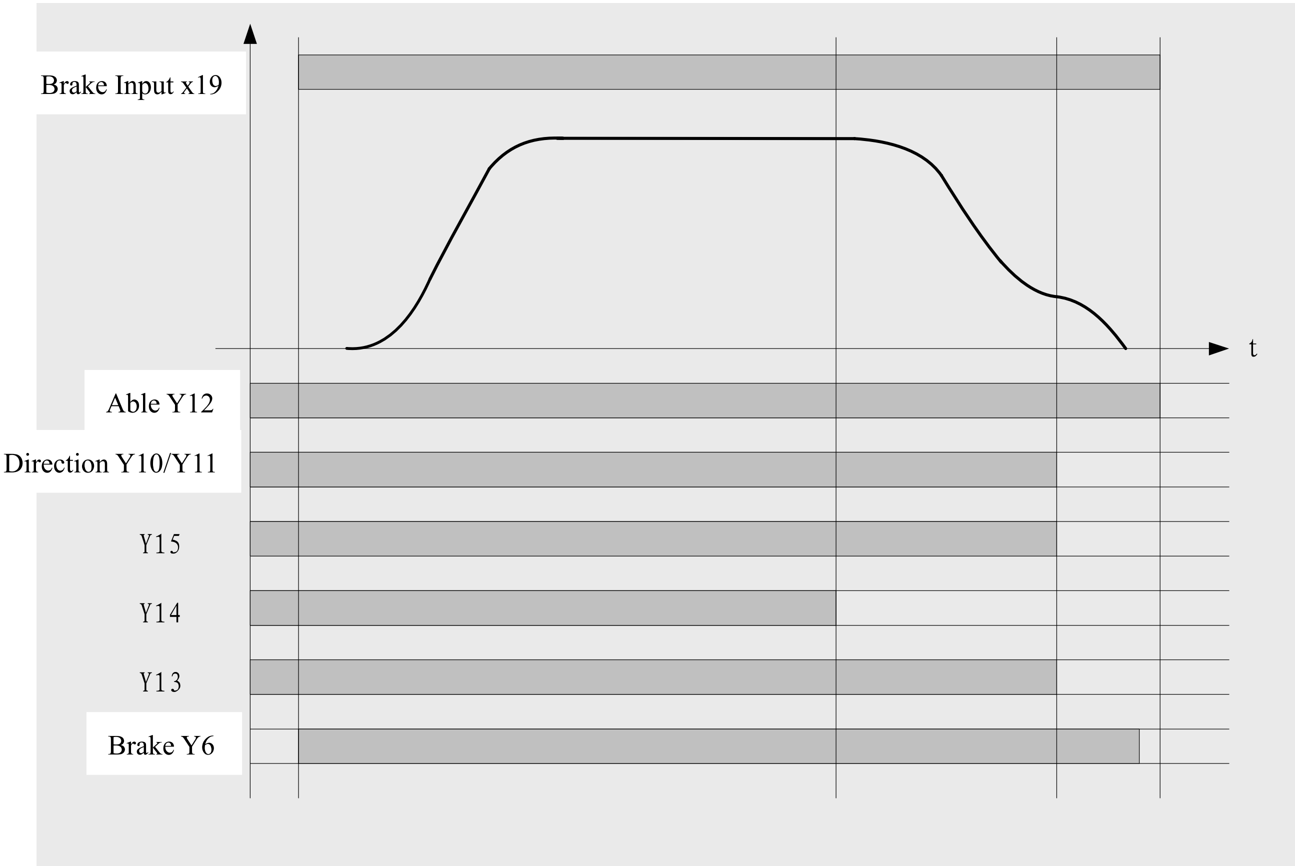


Table 5-6-2-6 (8) The sequential diagram of main control boar output when FU12 and FU13 are set on

5.7. The menu setting and operation of other parameters

5.7.1. Hoistway self learning

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

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

（**1**）Upper/lower limit position switch, upper/lower station switch and corresponding bridge plate are installed, all the wire connections are correct;

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

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

（**4**）The setting of system general parameters and operation parameter are finished.

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

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

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

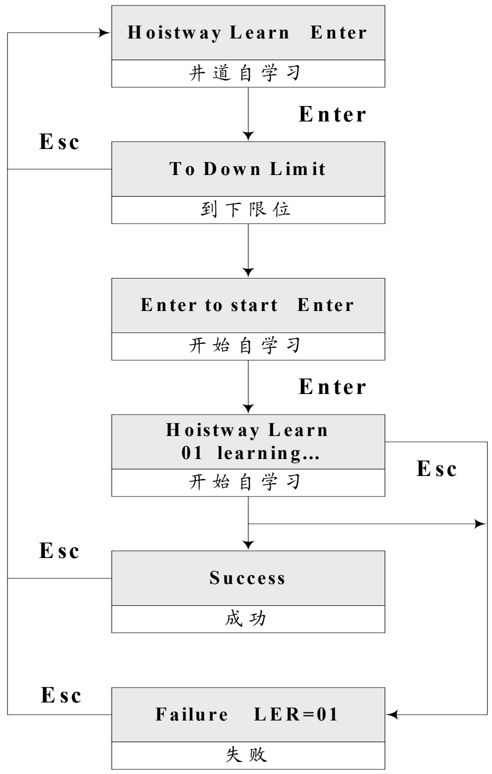
5. If **Enter To Start** is displayed at the lower limit position，press **Enter** key, the elevator will automatically begin its self learning；

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

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

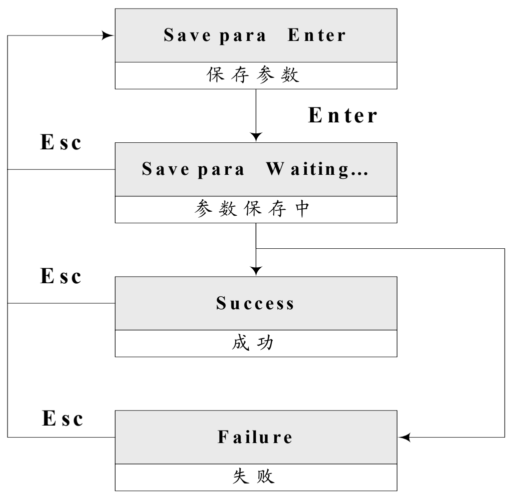
8. Failure LER=# will be displayed if self learning fails, please solve the problem according to the fault code prompt and continue the self learning (the significations of the fault code, please see the appendix);

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



5.7.2. Parameter saving

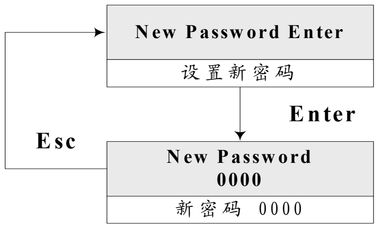
After entering the parameter saving menu, select **Yes** and press **Enter** key, the system will automatically save the revised parameter. If saving is successful, **Success** is displayed, otherwise **Failure** is displayed. Please contact our factory if parameter saving fails.



▲Note：the parameter which could be set will take effect instantly after modification. But if the parameter is not saved after modification, after turning off the power supply of the system, the parameter will be restored to the original one.

5.7.3. Password setting

This interface could be used for setting, modifying and saving the user's password.



Chapter 6 Debug and Operation of Bl2000 Serial Control System

6.1. Significant notice

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

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

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

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

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

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

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

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

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

10. If the mechanical and electric debug are both needed, the responsible staff which take the charge for the mechanical system debug should be at the site；

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

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

6.2. Inspection before power-up

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

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

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

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

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

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

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

6. To avoid damaging main board due to the inversion, please reconfirm if the connection and splicing position of power line terminal J4 of main board BL2000-STB.

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

7. Land the elevator in the middle leveling position.

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

6.3. Power-up and inspection

6.3.1. Confirmation before power-up

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

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

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

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

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

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

6.3.2. Inspection after power-up

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

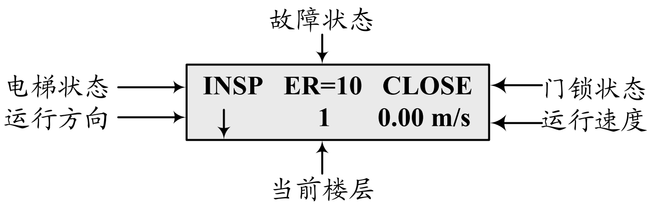
2. Check every terminal voltage of the transformer **TC1** in the control cabinet, their values should be within **±7% of the** marked value among every terminal. If the value exceeds the scope, find out the reason and correct it.

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

（**1**）Turn on **F4** Voltage between terminal **100** and **101** should be **110±7%VAC.**
Voltage between terminal **103** and **102** should be **110±7%VDC.**

（**2**）Turn on **F5** Voltage between terminal 2**00** and **201** should be **220±7%VAC.**

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



故障状态 fault state

电梯状态 elevator state

运行方向 running direction

门锁状态 door lock state

运行速度 running speed

当前楼层 current floor

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

Diagram 6-3-2 (4) Every terminal voltage of switch power supply

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

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

（**6**）If all the above are checked to be normal, further check the following:

- ◆ Check if the door lock circuit is normal.
- ◆ Check if the signal of landing and signal of upper/ lower limit are normal.
- ◆ Check if the electric lock is normal: set the automatic elevator turn-on/off time in the setting parameter as zero, and turn the electric lock to ON position, the elevator state displays on the LCD is **"INSP"** at this time, if turn to **OFF** position, **"STOP"** should be displayed.
- ◆ Check if the door open/close system works normally, if it doesn't, please make some relevant inspections.

6.4. Setting of system parameters

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

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

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

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

6.5. Trial Run at Lower Speed

6.5.1. Inspection Run of Machine Room

1. The things that should be confirmed before inspection run of the machine room:.

（**1**）The inspection switch of the control cabinet is switched to **"Inspection"** position, the inspection switches on and within the car is switched to **"Normal"** position.

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

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

（4）After power-on, the contactors of **KJT**、**KMB**、**KMC** in the control cabinet pull in, the powered inverter works normally and check if the parameters setting is correct, the elevator state displayed on the LCD is **"INSP"**.

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

2. Inspection run of the machine room

When the conditions of machine room inspection run are satisfied, press the slow up/down button, the elevator will run at the set inspection speed.

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

（2）When press the slow up (down) button, if the inverter displays that the motor feedback rotary speed is unstable or the deviation of the given value is too big, exchange phase **A** and **B** of rotary encoder after power off, and then power on again and operate the inspection.

（3）If the running speed of an elevator is stable, but the running direction is opposite to the button, exchange any two phase lines from the inverter to the motor after power-off, and exchange phase **A** and **B** of the encoder at the same time and then power on to inspect again.

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

6.5.2. Inspection Running of Car Top and Car

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

6.6. Hoistway Self-learning

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

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

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

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

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

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

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

7. In the process of the self-learning, if there are any abnormal phenomena in the control system, the self-learning will stop, and some fault numbers will be given, see the Appendixes for the fault list.

b) Notice：when the self-learning stops, only when "Success" is displayed on the screen，self-learning successfully finishes in real meaning. (please see the content of 5.7.1)

6.7. Trail Run at high speed

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

1. Set the elevator in the attendant state.

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

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

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

6.8. Elevator Comfort Adjustment

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

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

6.8.1. Adjustment of Startup and Brake Curves

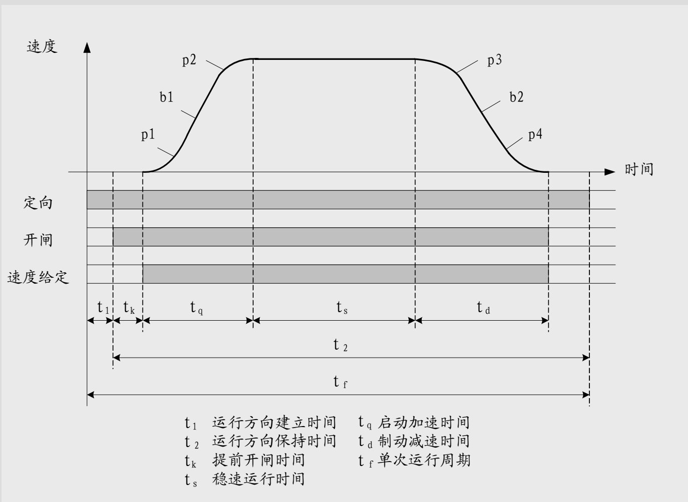


图 6-8-1 运行曲线图示

速度 speed

定向 direction

开闸 break

速度给定 speed reference

时间 time

运行方向建立时间 setup time of the running direction

运行方向保持时间 run time of the running direction

提前开闸时间 break on time
稳速运行时间 running time of the stable speed
启动加速时间 start-up and acceleration time
制动减速时间 brake and deceleration time
单次运行周期 single running period
图 6-8-1 运行曲线图示 Diagram 6-8-1 Diagram of the Running Curve

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

（**1**）**P1**：At the beginning of the start, the acceleration increases, which means the acceleration change rate of curve, the smaller this value is, the slower the start will be, and the better the stability will be.

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

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

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

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

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

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

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

6.8.2. Adjustment of Running Curve Tracing

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

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

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

Generally, adjust proportional gain, increase the value if the system is stable, and then regulate the score gain and make the system have the quick response and less overshoot.

6.8.3. Adjustment of Elevator Running Control Timing & Sequence

See the diagram **6-8-**1 for the elevator timing and sequence diagram of the system, the internal program of the main board can be implemented according to the control time sequence which the diagram shown, the parameters which the user can set are the brake time and zero speed setting.

1. The adjustment of prior break time

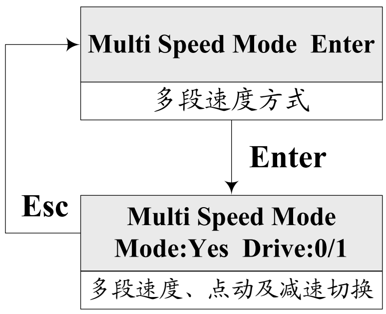
It is the delay time from inputting the break command to activating the curve to give out the command; the parameter is set for suiting the action time of the PM break. The value is regulated properly or not will greatly affect the comfort at the start point. If the value is too small, the elevator will start with brake. If it is too big, the elevator will slide when start-up.

2. Zero Speed Setting

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

6.8.4. Adjustment of Multi-speed Mode

When some brands of inverters are used (such as Fuji G11UD) and multi given speed command is needed, set the parameter as **Yes**, the simulation given value is **No**, the value of ex-work is **No**. When the mode of **Drive** is set as **0:** there is no inching output and deceleration time switch output mode ; If the mode of **Drive** is set as **1**：there is inching output and deceleration time switch output mode.



多段速度方式 multi-speed mode
多段速度，点动及减速切换 multi-speed, inching and deceleration switch

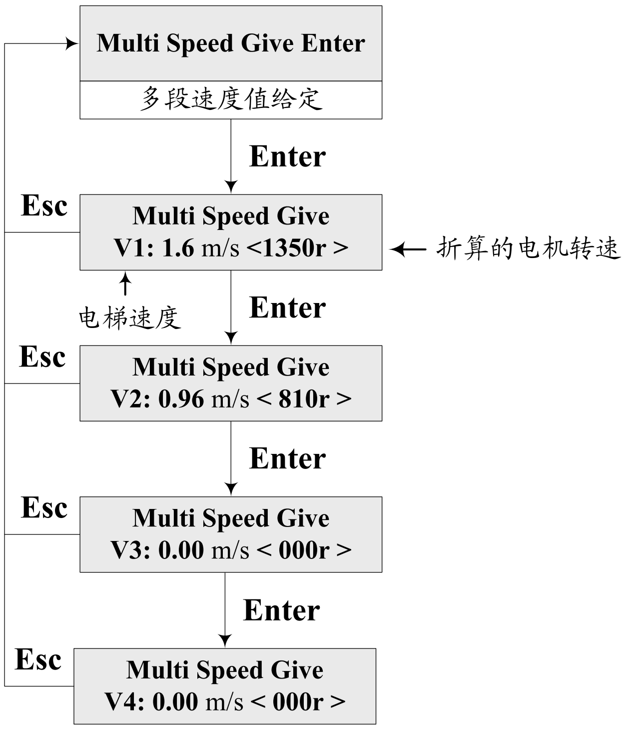
1. Setting of Multi Speed Value

When the multi speed mode is set as **Yes**, set the multi speed values and speed change distances, see the following list for the specific values (for reference only):

List 6-8-4-1Setting list of multi speed values and speed changing distances

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

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



多段速度值给定 multi speeds values reference
折算的电机转速 commuted motor rotary speed
电梯速度 elevator speed

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

2. Output logic of multi speed command

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

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

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

3. The output examples of multi speed

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

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

When **Drive** mode is set as **1**, there is some inching output and output mode of deceleration time switch, the maintenance speed only controlled by **Y1** output.

（3）**Running Curve of Self-learning and Creeping for Leveling (Diagram 6-8-4-3)**

（4）**Home Landing Return for Safety** (the same as the creeping for leveling, the position entering landing is the lowest landing)

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

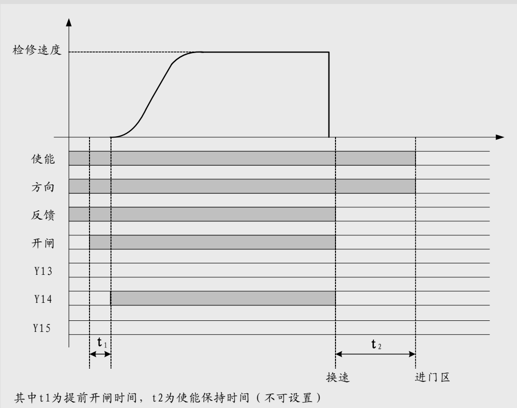


图 6-8-4-1 检修 (无点动) 运行曲线图示

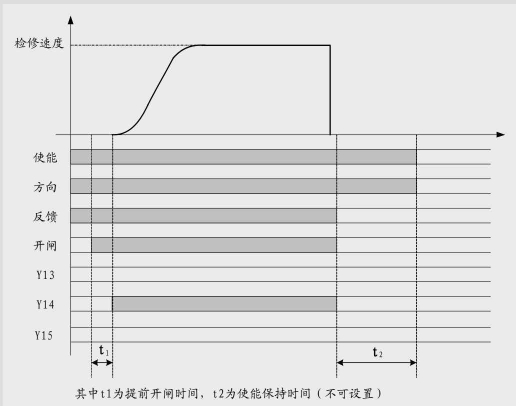


图 6-8-4-2 检修 (有点动) 运行曲线图示

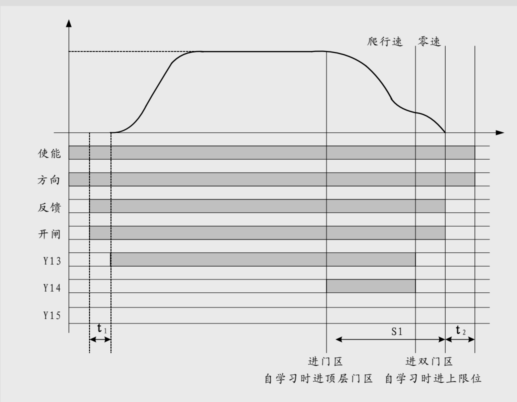


图 6-8-4-3 自学习或爬行找平层运行曲线图示

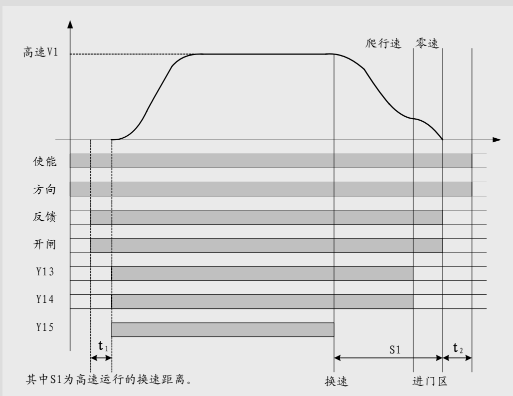


图 6-8-4-4 高速运行曲线图示

检修速度 Inspection speed
方向 direction
反馈 feedback
开闸 brake
换速 speed changing
进门区 entrance door area
其中 t1 为提前开闸时间，t2 为使能保持时间 (不可设置)
T1 is break on time and t2 is enable hold time (can’t be set)
图 6-8-4-1 检修 (无点动) 运行曲线图示 Diagram 6-8-4-1 Curve diagram of maintenance (no inching) running
图 6-8-4-2 检修 (有点动) 运行曲线图示 Diagram 6-8-4-2 Curve diagram of maintenance (inching included) running
使能   able
方向 direction
反馈 feedback
开闸 break
爬行速 creep speed
零速 zero speed
进门区 entering landing
进双门区 entering double landings
自学习时进顶层门区 entering the top landing when self-learning
自学习时进上限位 enter the top landing when self-learning
图 6-8-4-3 自学习或爬行找平层运行曲线图示 Diagram 6-8-4 Curve diagram of self-learning or creep for leveling running
高速 high speed
其中 S1 为高速运行的换速距离 S1 is the speed change distance when high speed running
图 6-8-4-4 高速运行曲线图示   Diagram 6-8-4-4 High-speed Running Curve diagram

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

▲**Notice**：

- ◆ When ex-work, the given point of zero (the output of **Y15**、**Y14**、**Y13** is **0**) speed is the position of single landing after the speed changing;
- ◆ If entering double landings needs to be given at zero speed segment, please contact our company and our engineer will help set;
- ◆ If setting **Drive** mode in the multi speed mode menu to **1**，when changing the creep into the zero given, the output is **Y0,** take Y0 as the deceleration time switch (for example when changing Yaskawa inverter from creep to zero speed, use the switch deceleration time to adjust the leveling).

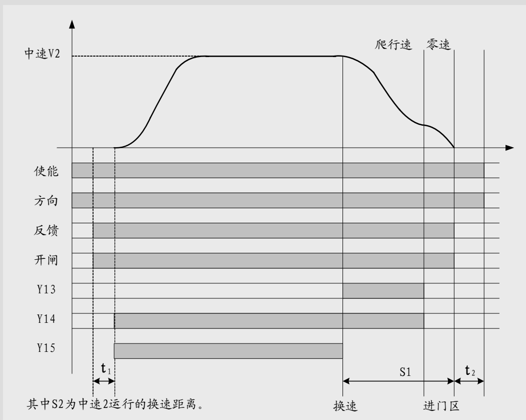


图 **6-8-4-5** 中速运行曲线图示

中速 medium speed
使能 enable
方向 direction
反馈 feedback
开闸 back
其中 S2 为中速运行 2 的换速距离 S2 is the speed changing distance when medium speed running 2
图 6-8-4-5 中速运行曲线图示 Diagram 6-8-4-5 Curve diagram of the medium speed running
换速 speed changing
进门区 entering landing
爬行速 creep speed
零速 zero speed

6.9. Adjustment of Leveling Precision

Adjust the leveling precision after the adjustment of comfort sense.

1. The basic condition to guarantee the leveling of the elevator

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

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

（**3**）The bracket should be firm;；

（**4**）The installation position of the bridge plate must be correct. When the car is leveling, the central point of bridge plate should coincide with that of distance between the sensors for two landings (see Diagram **4-3-3-1**), or the leveling point of this floor will migrate, namely both the upper and lower points are higher and lower than the leveling point.

（**5**）If the magnetic switch is adopted, guarantee the enough depth the bridge plate can insert, or it will affect the action time of the inductive switch and cause the higher or lower leveling of this floor;

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

（**7**）During the actual adjustment, firstly adjust one floor of ones till its correct leveling. And then regulate other floors on the basis of this parameter.

（**8**）Through the curve selection and adjustment of proportional and integral gain in the previous paragraph, it should be ensured that the elevator runs the middle floor and stops whenever running upwards or downward the stop positions are nearly the same (namely the stop position error will be**≤±2～3mm**).

2. Leveling precision adjustment of multi speed modes

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

The system requires the elevator go into the creep state after the deceleration, it is the basic condition of the leveling of the elevator. If there is no creep, it means that the deceleration is too slow; if the creep time is too long, it means the deceleration curve is too curly. Regulate the deceleration curve and make it a proper creep.

（**2**）Low up, high down or high up, low down

When low up and high down appear it means the creep speed is low; when high up and low down appear, it means the creep speed is high. Adjust the speed.

（**3**）Low up, low down or high up, high down

When low up, low down or high up, high down appear after car stops, it means that the position of landing bridge plate deviates, please adjust it.

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

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

- ◆ Install the terminal switch to the position which is over the speed change distance;
- ◆ The elevator quickly runs to the terminal, changes speed and stops, it will cause no leveling;
- ◆ Immediately switch the system into the inspection state;
- ◆ Measure the distance between the elevator and the leveling, which is the distance that the upper terminal needs to be regulated upwards.

The lower terminal should be adjusted in a similar way.

3. Leveling precision adjustment of simulation given mode

（**1**）The repeatability confirmation of the stop position

Through the curve selection and adjustment of proportional and integral gain in the previous paragraph, it should be ensured that the elevator runs the middle floor and stops whenever running upwards or downward the stop positions are nearly the same (namely the error among every stop position will be**≤±2～3mm**).

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

- ◆ The elevator lands floor by floor, measure and record deviation value △**S** between car sill and landing door sill when the car stops at every floor (if the car sill is higher than the landing door sill, the value is positive, or else it will be negative).
- ◆ Adjust the position of landing bridge plate floor by floor, if △**S＞0**, move the landing bridge plate △**S** downwards; If △**S＜0**，move the landing bridge plate △**S** upwards.
- ◆ After regulating the landing bridge plate, carry out the hoistway self-learning again.
- ◆ Recheck the leveling, if the leveling precision can not meet the requirement, repeat steps from **(1) to (3)** .

（**3**）Regulate the parameter menu

If the position where the elevator stops is repeatable, but for one floor, the upper and lower leveling are not at the same place, if higher up and lower down or lower up and higher down, adjust it using the leveling adjustment parameter menu (**Leveling Adj**) in the parameter menu. The default value of this parameter is **50mm**，if higher up and lower down, decrease this value, whereas increase it. The adjustment amount is half of the leveling deviation value, for example, if the deviation value of higher up and lower down is **20mm**，reduce it to **10mm**.

6.10. Confirmation of Terminal Installation Position

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

1. Make the elevator in the inspection state;

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

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

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

Chapter 7 BL2000 Serial Control System Failures Analysis

7.1 Running State during Inspection

- Under the state of inspection, no matter whether the communication is normal or not, as long as the running state of the elevator (door lock, brake, open/close door) is normal, the operation condition is therefore satisfied and the maintenance control can be applied.
- When the input signal **X1 (X2)** is valid, the main control computer board will output **Y10 (Y11) and Y12**;
- The rated voltage of simulative signals are **J7-9～J7-10 > 2V**, and the **Y14** is valid under the mode of multi speed;
- The converter outputs operating signal, which makes the input signal **X19**of main board valid and the motion of contactor KDY normal. Otherwise, please note:
- Whether the output signal of the open/close door of main board is normal;
- Whether the input signal of converter is normal and the parameter setting is correct.

7.2 The low traveling speed and the heavy current during inspection

The occurrence of such phenomenon due to the following possibilities:

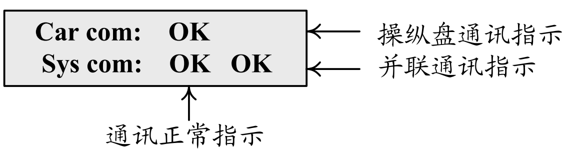
1. Phase Sequence of the encoder is reversely connected;
2. The encoder is abnormal and the pulse is lost;
3. The setting of pulse number of encoder is wrong;
4. The set of poles of electric motor is wrong.

7.3 The speed displayed by the main board is incorrect.

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

7.4 Check on the abnormity of communication

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



操纵盘通讯指示　Indication of control board Communication

并联通讯指示　Indication of Parallel Communication

通讯正常指示　　Indication of Normal Communication

Otherwise, the following problems may occur:

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

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

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

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

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

7.5 Abnormity of switching power supply (5V/24V)

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

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

7.6 Checks on no direction and brake output signal

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

1. Door lock failure

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

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

2. Door open fault

If the fault of unlock of the door happens, when the car uses dot-matrix display board, it will usually display the character "U". The reference solutions are as follows:

- ◆ Set the elevator to be under the state of inspection, input the door open command (given by the car exit button or the LCD menu), observe that whether there's output of door open signal (Y4), If there's an output of door open signal, please observe if the door open relay is closed (in case that there's door open relay), if the door open output is normal, but the door doesn't open. Please check if the connection between the door open signal and the machine room cabinet is correct, or check if the door condition is correct.
- ◆ Under the status of inspection, when there's input of door open command, but no door open output

(Y4) , check if the open door limit input or the close door limit input is correct. Inspect U07 (open door limit), (and whether the back door U05 is "■"under the rear opening mode).

- Under the normal condition, the U06 will become valid when the car door closes to its designated position (the crystal display changes from "□" to "■"), U07 becomes invalid (the crystal display changes from "■" to "□"); when the car door opens to the designated position, U07 becomes valid and U06 becomes invalid; when the car door opens to the middle position, U06 and U07 will become invalid at the same time.
- If the inspection results do not conform to the above situation, it is probably that the installation of open door limit switch or the close door limit switch is incorrect or the applied type of contact is incorrect. If U06 is invalid while U07 is valid when the car door closes to its designated position, and U06 is valid while U07 is invalid when the car door opens to its designated position, it belongs to the problem of reversal connect, please correct it; if both U06 and U07 are valid when the car door opens to the middle position, it may result from that the setting of adopted input type of normally opened or closed contact is unmatched, then please change the type of contact or alter the setting of valid electrical level at the input port. (Please alter the input type of U04~U07 on the Input Type of the menu.)
- When the elevator is rear opening, please notice that whether the open/close door of the front door and rear door is set reversely, and whether the touch panel, screen signal is corresponding, please observe the status of I/O Car Data referring to the above operation. Note: Please confirm the front/rear door respectively.

7.7 Unlock of the door

Under the normal operational status, the door of elevator opens and then automatically closes. If the door is not closed right, it will open the door and repeat for several times, the methods of check and diagnose are as follows:

1. Check whether the close door is blocked;
2. Confirm whether the traveling route of close door is too long;
3. If it's unable to close the door within the operation time of open/close the door in the system, please adjust the Door Run Time.
4. It also may be that the door limit installation or the contactor type is incorrect, please refer to the "**open door failure**" to check and solve it.
5. If the open door or close door is normal under the inspection status, but it doesn't close the door when the elevator enters into the normal status. At this time, please check the switch of safety edge or whether the input type of the switch is correct. Observe the signal of U18 safety edge switch signal (the rear door of rear opening, see U17) in the I/O Car Data menu, if the safety edge or the screen is, U18 should be valid (the LCD display changes from "□" to "■"), if the safety edge is unlocked, U18 should be invalid (the LCD display changes from "■" to "□"). If it is contrary to the above situation, please change the type of contact or adjust the setting of valid electrical level at the input port, the Input Type setting in the menu U17~U18). If the U18 is valid at all the time, please check the connection between the input port of safety edge and the safety edge switch of car board. If the inputs of safety edges are correct, please confirm if the overload U15 is valid (overload and unopened).

7.8 Malfunction of elevator arisen from wrong setting of switching value output of load test device

1. If the system is installed with load test device, and the state of load test is output to the car board, namely J9-8 light load input, J9-6 full load input, J9-5 overload input, so please confirm the type of connection point

of switching value output, for example, for the normal opened contact, please set the input type of U13, U14 and U15 ON in Input Type, (Otherwise, for the normal closed contact, please set it OFF).Please observe whether the U13,U14,U15 in the car signal of I/O Car Data is correctly input according to the load state.
2. If the number of passengers in the car is large, and the selected numbers are automatically canceled when there are more than three selections, it may be caused by the incorrect input of light load;
3. When the elevator is empty and it doesn't response to the call, it is probably because that the full load input is always valid;
4. If the phenomenon of unclose of the door appears, it is probably because that the overload input is always valid.

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

1.If the two pulses of the main board A and B is adversely connected, namely, the feedback speed displayed by main board is negative when the elevator is up, and the feedback speed is positive when the elevator is down, then exchange the two phases of A and B of input pulse on the main board.
2. If the direction of elevator running is contrary to the designated direction, please change the phase of eclectic motor and the A, B phase of encoder.
3. If the directions of feedback speed display keep unchanged when the elevator is up and down, it may be caused by the loss of phase of A, B pulse. If the feedback speed is positive no matter when the elevator is up or down, the phase B is probably lost. The solution is as below:

- ◆ Firstly cancel the A phase input from the main board pulse, and there will be no feedback speed display during running. Then cancel the phase B input, connect the phase A to phase B;
- ◆ When it starts again, if there's feedback speed display, it may indicate that there's some problem on the connection between frequency divider and phase B of the main board.
- ◆ If phase A input is connected to phase B and there's no display of feedback speed, it is probably that the circuit of phase B input of main board is damaged, please change the main board and test again;

4. If the display of feedback speed on main board is always negative no matter when the elevator is up or down, the judgment is contrary to the above.

7.10 Failure on brake on (ER05)

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

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

The main board must receive the pulse signal from transducer (the frequency divider of transducer) during the operation of elevator, if small number of pulse or no pulse input is detected, there are probably such reasons below:

1. The connection between pulse input port and frequency divider is disconnected;
2. If the source of pulse signal is the long line driver type, A,B phase may be wrongly connected (such as A and B or –A and -B wrongly matched);
3. If the connection is correct, please use multimeter to check the voltage for diagnose;

- When using the push-pull pulse source, the voltage between J8-1 (the positive test pen) and J8-5of low-speed rotating electric motor, J8-1 and J8-6 is around **+6V.**
- When using the line driver pulse source, the voltage between J8-7(the positive test pen) and J8-8 should be **2.5V or -2.5V**, that between J8-9(the positive test pen) and J8-10 should be **2.5V or -2.5V.**
- The correctness of the above voltage is the basis of judging the failure: if the voltage is correct, the failure lies in the main board, otherwise the failure lies in the frequency divider (encoder).

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

If such phenomenon occurs, there are following possibilities:

1. KDY (contactor) sticks;
2. KDY doesn't switch on when the main board outputs Y9. The connection breaks or the KDY contactor is damaged;
3. KDY feedback contactor is bad contacted.

7.13 The mistake of building floor counter (ER14)

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

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

$$\frac{\text{Rated rotating speed} \times \text{The pulse count of encoder}}{60 \times \text{Frequency dividing coefficients} \times 1000} < 25\text{KHZ}$$

7.14 The main board's not receiving feedback of transducer (ER17)

When the main board sends out instruction (direction, enable) and doesn't receive feedback from the transducer (X19). At this time, the following check should be carried out:

1. Please check the direction, enable signal of transducer and the output circuit of function signal;
2. Check if the setting of relevant parameters of transducer on input and output is correct;
3. Check if the transducer is under the state of operation.

7.15 The value of floor counter is wrong (ER18)

If such phenomenon occurs, there are following possibilities:

1. The hoistway self learning is not finished, the floor data on the main board is inconsistent to the actual floor;
2. The end station switch of the hoistway; after the installation position of switch 1 and switch 2 of the upper and lower end station changes, hoistway self learning is not applied.
3. The big error of encoder pulse input, refer to ER14 for treatment.

7.16 The low-speed adjusting distance is longer than the interval of a single floor (ER19)

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

1. When using the simulation set, such defaults occur when it runs from the second top floor to the top floor or it runs from the second lowest floor to the lowest floor. You may add the parameter of deceleration time b1, b2 to the simulative curve, and the set values of p1, p2, p3 and p4 increase. When the speed of elevator is larger than 1 m/s, the failure may be eliminated by decreasing the single floor running speed.
2. When multi-segment given is used, the running distance with the minimum speed is larger than the singlew floor distance; therefore the speed of the segment can not be selected during the single floor running.

▲Note: The speed adjusting distance at the lowest running speed(m) ×2＋0.15 (m) < the smallest floor interval (m)

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

Please check the thermal switch loop (The input point is X21).

7.18 The state of contact of gate interlock is inconformity with the state of the coil (ER26)

According to the requirement of **GB7588-2003 Standard to the gate interlock, BL 2000 main board** is designed with the monitor function for gate interlock loop and its feedback contact; under normal condition, the motion of coil and the contact (X14 and X23) should keep in conformity, or there will be failure alarm.

The state of contactor of gate interlock is inconsistent with the state of the coil, that is to say X14 and X13 (terminal No. X24, X25) are inconsistent. Observe the input indicator LED X14 and LED X23, when the gate interlock switch on or switch off, LED X14 and LED X23 should be on or off correspondently.

1. If there are not on at the same time, please check the outer connection.
2. If they are on or off at the same time, please observe if the input signal display on the monitoring menu conforms to the state of LED indicator, if the display of X23 input signal is inconsistent to the state of LED X23 indicator, it is possibly that the voltage input of X23 to the circuit is not compatible.

7.19 The inconformity between state of emergency stop contactor and the state of the coil

The state of emergency stop contactor is inconsistent with the state of the coil, namely, X13 and X22 (terminal no. X22, X 23) are inconsistent**.**

1. Observe the input indicator LED X13 and LED X22, when emergency contactor switch on or switch off, LED X13 and LED X22 should on and off at the same time.
2. If they are not on or off at the same time, please check the outer connection;
3. If they are on and off at the same time. Please observe if the input signal on the monitoring menu conforms to the state of LED indicator, if the display of input signal X22 is not conform to the state of LED X22 Indicator, it is probably that the voltage of input circuit X22 is inconsistent.

Appendix 1　Connection Diagram and Parameter Setting for Inverters Controlled by Asynchronous Motor

1. Connection graph and parameter setup menu of YASKAWA 616G5、676GL5-JJ Transducer

（1）　Wiring diagram of transducer terminals (See the schematic diagram of typical control circuit in this manual)

（2）　Instruction for keying

MENU、ESC key：　Displaying, exiting menu；　“∧”、“∨” key：　Selecting menu, and modifying values

“＞” key：　Selecting the modifying bit；　DATA、ENTER key：　Confirming

（3）　Parameter setup of transducer(for reference only)：simulation + multi-segment

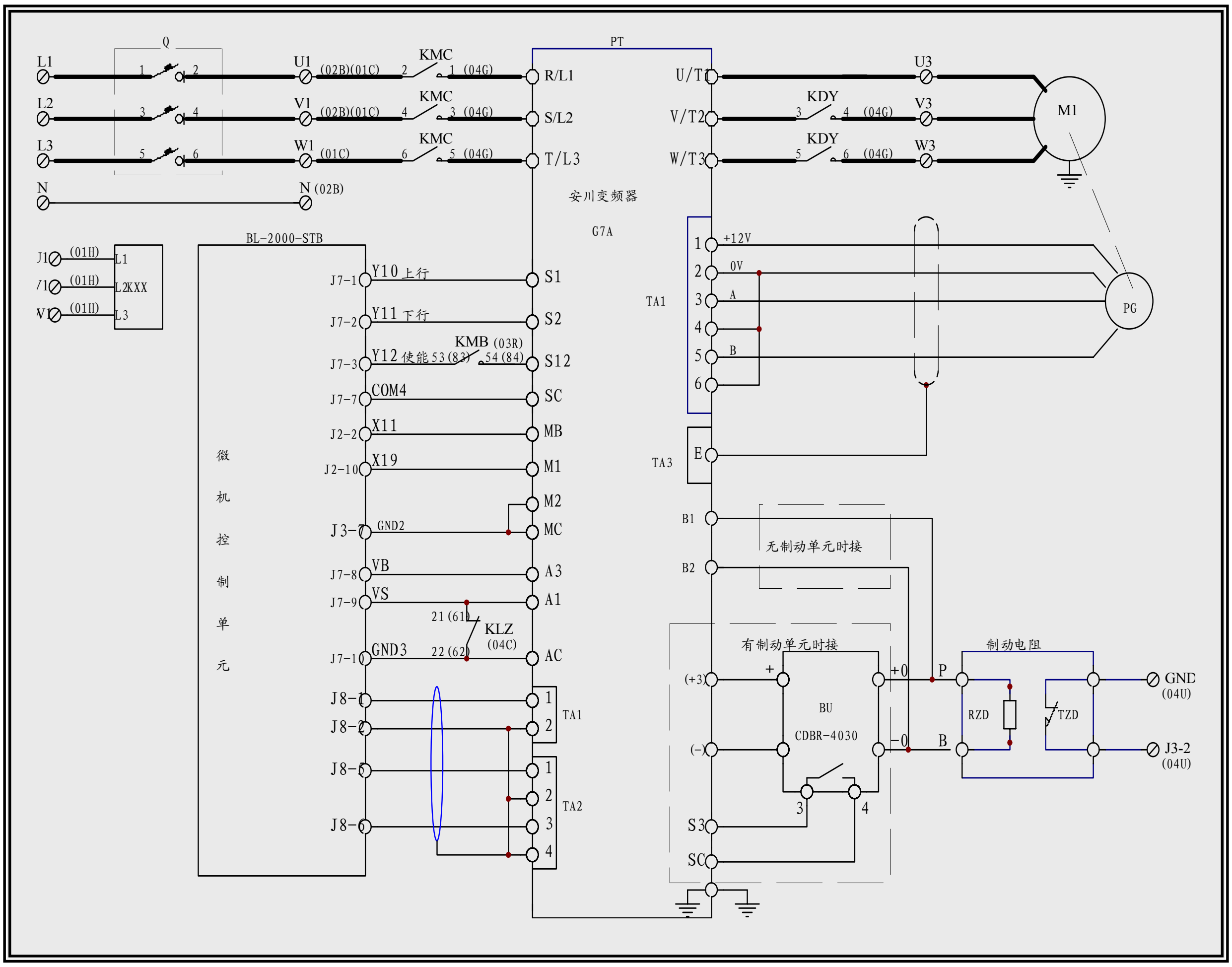
Parameters	**Names**	**Setting values**	**Comments**
A1-02	Selection of Control mode	3	With PG vector control
A1-00	Language Selection	0	
A1-01	Parameter access level	4	
B1-01	Selection of speed instruction	1	Setting 0 when multi speed
B1-02	Selection of running instruction	1	
B1-03	Selection of stop method	1	
B1-04	Selection of inversion inhibition	0	
B2-01	Zoro velocity level	0.1	
B2-03	DC braking time when starting	0	
B2-04	DC braking time when stopping	1	
C1-01	Acceleration time 1	0.1	Setting 2.0 when multi speed (for reference)
C1-02	Deceleration time 1	0.1	Setting 2.0 when multi speed (for reference)
C1-03	Acceleration time 2	2	Setting 2.0 when multi speed (for reference)
C1-04	Deceleration time 2	2	Setting 2.0 when multi speed (for reference)
C2-01	S characteristic time when beginning acceleration	0	Setting 1.5 when multi speed (for reference)
C2-02	S characteristic time when stopping acceleration	0	Setting 1.5 when multi speed (for reference)
C2-03	S characteristic time when beginning deceleration	0	Setting 1.5 when multi speed (for reference)
C2-04	S characteristic time when stopping deceleration	0	Setting 1.5 when multi speed (for reference)
C5-01	ASR proportion gain 1	10	
C5-02	ASR integral time 1	0.35	

D1-02	Frequency instruction 2	0	Self leaning speed when multi speed(setting as the actual requirement)
D1-03	Frequency instruction 3	0	Inspection traveling speed when multi speed(setting as the actual requirement)
D1-04	Frequency instruction 4	0	Creep speed when multi speed(setting as the actual requirement)
D1-05	Frequency instruction 5	0	Low speed when multi speed (V1) (setting as the actual requirement)
D1-06	Frequency instruction 6	0	Medium speed when multi speed 1 (V2) (setting as the actual requirement)
Parameters	**Names**	**Setting values**	**Comments**
D1-07	Frequency instruction 7	0	Medium speed when multi speed 2 (V3) (setting as the actual requirement)
D1-08	Frequency instruction 8	0	High speed when multi speed (V4) (setting as the actual requirement)
D1-09	Inching instruction 2	200	
E1-01	Transducer input voltage	380	
E1-02	Selection of motor	0	
E1-04	Maximum output frequency	50	
E1-05	Maximum voltage	380	
E1-06	Basic frequency	50	
E1-09	Minimum output frequency	0	
E2-01	Motor rated current	*	See nameplate
E2-02	Motor rated slip	*	See nameplate
E2-03	Motor no-load current	*	35-40% of rated current
E2-04	Motor pole numbers	*	See nameplate
F1-01	PG constant	*	According to setting of encoder
F1-02	PG action selection when disconnection detection	1	
F1-03	Action selection when overspeed	0	
F1-04	Action selection when too large velocity deviation	0	
F1-06	Frequency division ratio	1	
F1-08	Detection standard when overspeed	105	
F1-09	Detection delay time when overspeed	1	
F1-10	Detection standard when too large	30	

	velocity deviation		
F1-11	Detection delay time when too large velocity deviation	1	
H1-03	Function selection of terminal 5	F	(Setting 3 when multi speed)
H1-04	Function selection of terminal 6	F	(Setting 4 when multi speed)
H1-05	Function selection of terminal 7	6	Inching (Setting 5 when multi speed)
H1-06	Function selection of terminal 8	9	
H2-01	Function selection of terminal 9	F	
H2-02	Function selection of terminal 25	37	
H3-01	Electrical level selection of terminal 13	0	
H3-02	Input gain of terminal 13	*	Setting as the given analog voltage maximum and elevator speed
H3-03	Input deviation of terminal 13	0	
H3-04	Electrical level selection of terminal 16	1	
H3-05	Function selection of terminal 16	14	
H3-06	Input gain of terminal 16	0	
H3-07	Input deviation of terminal 16	0	
L3-04	Stall function selection when deceleration	0	
L5-01	Restart times when abnormal reset	5	
L8-05	Action selection of input side open-phase protection	1	
L8-07	Action selection of output side open-phase protection	1	
O1-01	Monitor selection	5	
O1-02	Monitor selection when power supply input	1	
O1-03	Speed display unit	*	Motor pole numbers
O1-04	Unit setting of frequency instrument	0	

2. Connection graph and parameter setup menu of YASKAWA G7A Transducer

（1） **Connection graph of transducer terminals**



（2） **First setting “control mode” parameter A1-02=3.**

（3） **Then using “initialization” parameter A1-03=2220 to initialize the transducer parameter.**

（4） **Setting transducer parameters as table below (for reference only): simulation+multi-segment**

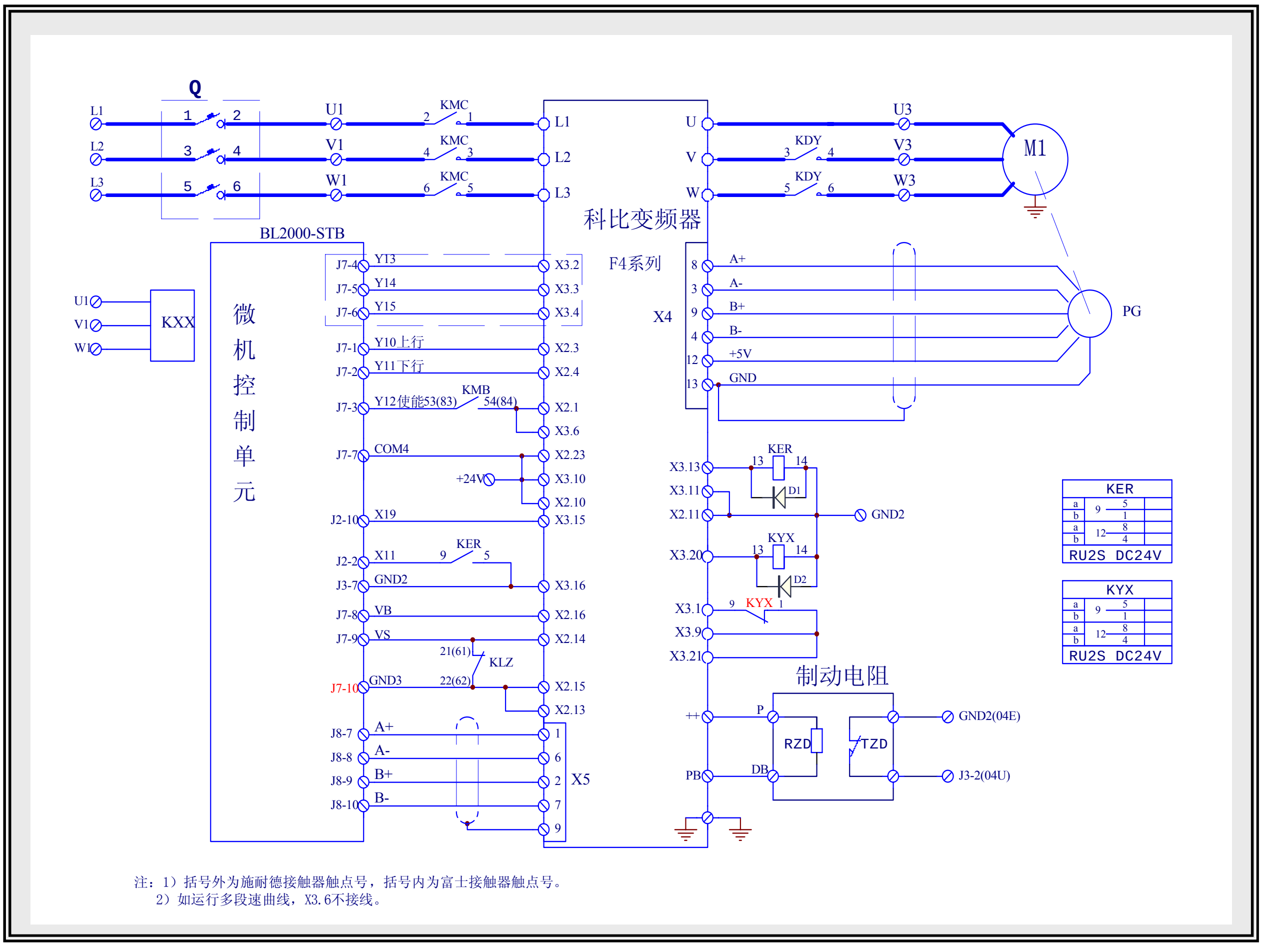
parameters	**Names**	**Setting values**	**Comments**
A1-02	Selection of Control mode	3	
A1-00	Language Selection	0	
B1-01	Selection of speed instruction	1	Setting 0 when multi speed
B1-02	Selection of running instruction	1	
B1-03	Selection of Stop method	1	Debug setup: 0
B1-06	Time selection for control terminal scanning twice	0	
B2-01	Zoro speed level	0.1	Debug setup: 0.5
C1-01	Acceleration time 1	1.0	Setting 2.0 when multi speed (for reference)
C1-02	Deceleration time 1	1.0	Setting 2.0 when multi speed (for reference)
C1-03	Acceleration time 2	2.0	Setting 2.0 when multi speed (for reference)
C1-04	Deceleration time 2	2.0	Setting 2.0 when multi speed (for reference)
C2-01	S characteristic time when beginning acceleration	0	Setting 1.5 when multi speed (for reference)
C2-02	S characteristic time when stopping acceleration	0	Setting 1.5 when multi speed (for reference)

C2-03	S characteristic time when beginning deceleration	0	Setting 1.5 when multi speed (for reference)
C2-04	S characteristic time when stopping deceleration	0	Setting 1.5 when multi speed (for reference)
C5-01	ASR proportion gain 1	10	
C5-02	ASR integral time 1	0.35	
D1-02	Frequency instruction 2	0	Self leaning speed when multi speed(setting as the actual requirement)
D1-03	Frequency instruction 3	0	Inspection traveling speed when multi speed(setting as the actual requirement)
D1-04	Frequency instruction 4	0	Creep speed when multi speed(setting as the actual requirement)
D1-05	Frequency instruction 5	0	Low speed when multi speed (V1) (setting as the actual requirement)
D1-06	Frequency instruction 6	0	Medium speed when multi speed 1 (V2) (setting as the actual requirement)
D1-07	Frequency instruction 7	0	Medium speed when multi speed 2 (V3) (setting as the actual requirement)
D1-08	Frequency instruction 8	0	High speed when multi speed (V4) (setting as the actual requirement)
D1-17	Inching frequency instruction	200	Frequency instruments when multifunction input “selecting inching frequency” and “FJOG instrument” are on.
E1-01	Transducer input voltage	380	
E1-04	Maximum output frequency	50	This parameter is same as E1-06
E1-05	Maximum voltage	380	Setting as rated voltage.
E1-06	Basic frequency	50	Setting as rated frequency.
E1-09	Minimum output frequency	0	
E2-01	Motor rated current	*	Setting as rated current.
E2-02	Motor rated slip	*	Using equations to calculate slip as rated revolutions.
E2-03	Motor no-load current	*	35%～40% of rated current
E2-04	Motor pole numbers	*	See motor nameplate
E2-11	Motor rated capacity	*	
F1-01	PG pulse numbers	*	Setting as actual installing encoder
F1-03	Action selection when overspeed	0	
F1-04	Action selection when too large velocity deviation	0	
F1-10	Detection standard too large velocity deviation	30	
F1-11	Detection delay time when too large velocity deviation	1.0	
H1-01	Function of selecting terminal S3	24	Multifunction contact inputting 1
H1-02	Function of selecting terminal S4	F	Multifunction contact inputting 2
H1-03	Function of selecting terminal S5	F	Multifunction contact inputting 3 (Setting 3 when

			multi speed)
H1-04	Function of selecting terminal S6	F	Multifunction contact inputting 4 (Setting 4 when multi speed)
H1-05	Function of selecting terminal S7	F	Multifunction contact inputting 5 (Setting 5 when multi speed)
H1-06	Function of selecting terminal S8	F	Multifunction contact inputting 6
H1-07	Function of selecting terminal S9	F	Multifunction contact inputting 7
H1-08	Function of selecting terminal S10	F	Multifunction contact inputting 8
H1-09	Function of selecting terminal S11	F	Multifunction contact inputting 9
H1-10	Function of selecting terminal S12	9	Multifunction contact inputting 10
H2-01	Function of selecting terminal S M1-M2	37	
H3-01	Selecting frequency instrument (voltage) terminal A1 signal electrical level	0	
H3-02	Selecting frequency instrument (voltage) terminal A1 input gain	100%	Setting as the given analog voltage maximum and elevator speed
H3-03	Selecting frequency instrument (voltage) terminal A1 signal offset	0	
H3-04	Selecting multifunction analog input terminal A3 signal electric level	1	
H3-05	Selecting multifunction analog input terminal A3 function	14	
H3-06	Selecting multifunction analog input terminal A3 input gain	100%	
L5-01	Restart times when abnormal reset	5	
L8-05	Action selection of input side open-phase protection	1	
L8-07	Action selection of output side open-phase protection	1	
O1-01	Monitor selection	5	
O1-02	Monitor selection when power supply input	1	
O1-03	Selection of frequency instrument	*	Setting as motor pole numbers
O1-04	Unit setting of frequency instrument	0	
O2-01	Function selection of local and remote keys	0	
O2-02	Function selection of STOP key	0	
L3-04	Stall preventing function selection when deceleration	0	

3. Connection graph and parameter setup 3.0 version of KEB F4 Transducer

（1） Connection graph of transducer terminals



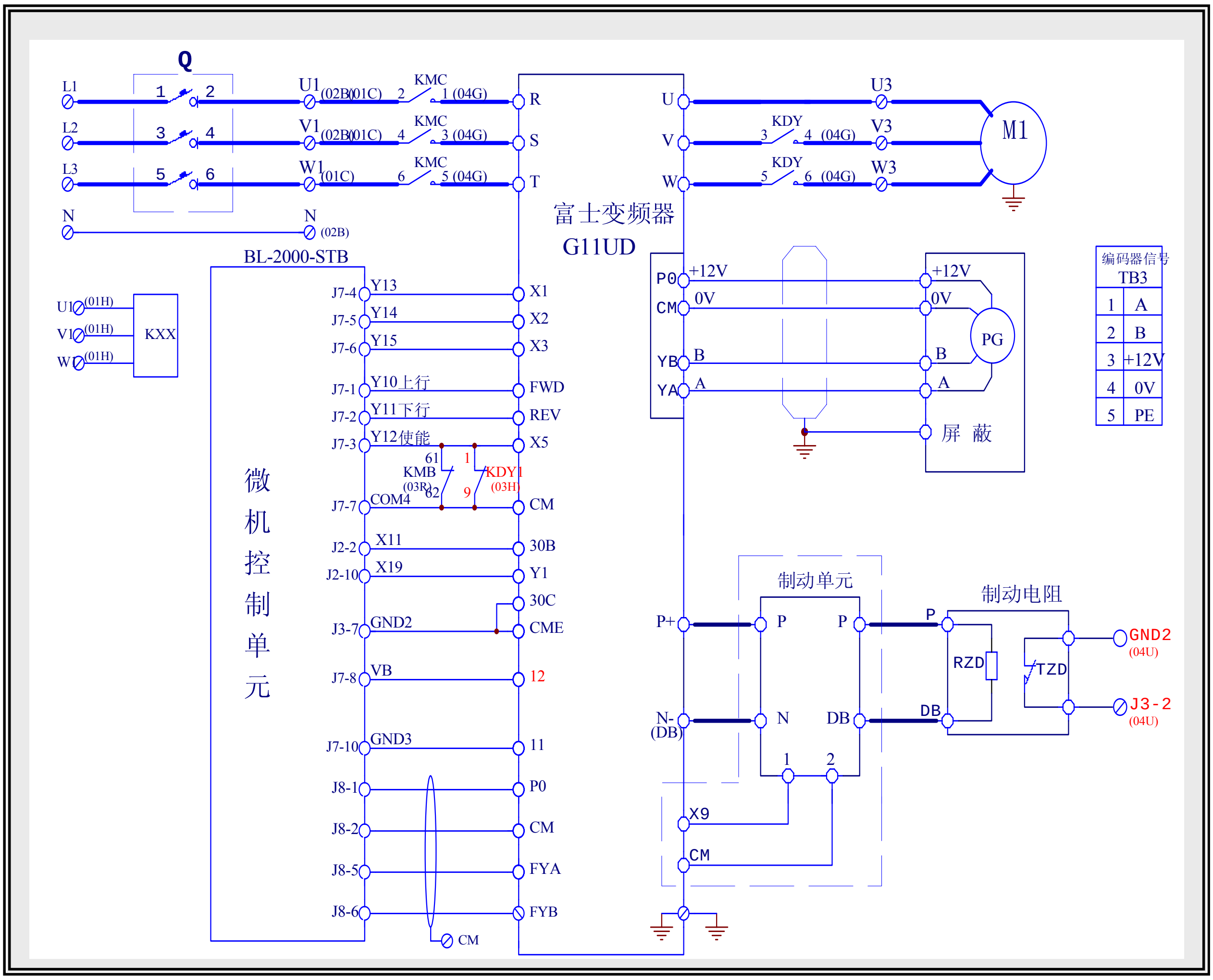
（2） Setting transducer parameters as table below (for reference only): simulation

Parameters	Names	Setting values	Comments
LF.00	Password	-4	
LF.01	User password	440	
LF.02	Operation mode	3	
LF.03	Frequency dividing coefficient	1	
LF.04	Motor selection	0	
LF.05	Running direction adjustment	0	
LF.10	Rated power of asynchronous motor		Setting as spot actual parameter
LF.11	Rated speed of asynchronous motor		Setting as spot actual parameter
LF.12	Rated current of asynchronous motor		Setting as spot actual parameter
LF.13	Rated frequency of asynchronous motor		Setting as spot actual parameter
LF.14	Rated voltage of asynchronous motor		Setting as spot actual parameter

LF.15	Power factor of asynchronous motor		Setting as spot actual parameter
LF.16	Speed of weak magnetic field		Setting as spot actual parameter
LF.17	Encoder resolution of asynchronous motor		Setting as spot actual parameter
LF.18	Encoder phase sequence of asynchronous motor	0	
LF.19	DC voltage compensation	400	
LF.20	Rated system speed		Setting as spot actual parameter
Parameters	**Names**	**Setting values**	**Comments**
LF.21	Diameter of hoist wheel		Setting as spot actual parameter
LF.22	Reduction ratio of hoist machine		Setting as spot actual parameter
LF.23	Roping mode of hoist rope		Setting as spot actual parameter
LF.24	Deadweight		
LF.30	Control mode	2 or 3	2:closed loop 3: closed loop + pre-torque
LF.31	Velocity proportion of asynchronous motor	3000	
LF.32	Velocity integral of asynchronous motor	1000	
LF.33	Velocity integral offset of asynchronous motor	1000	
LF.34	Current proportion of asynchronous motor	1500	
LF.35	Current integral of asynchronous motor	500	
LF.36	Maximum torque of asynchronous motor	2×LF91	
LF.38	Modulation frequency transform	0	
LF.50	Rapid acceleration	9.99	
LF.51	Acceleration	2.0	
LF.52	Rapid deceleration	9.99	
LF.53	Deceleration	2.0	
LF.54	Parking slope	9.99	
LF.60	Braking speed	0.005	
LF.61	Overspeed monitor	1.1×LF20	
LF.62	Deceleration monitor	0.95LF20	
LF.63	Creeping monitor	0.25	
LF.64	DC voltage monitor		
LF.65	Overheat delay monitor	300	
LF.66	Radiator temperature monitor	40	
LF.67	Pretorque gain	1	
LF.68	Pretorque deviation	0	
LF.69	Pretorque direction	0	
LF.70	Braking open time	0.3	

4. Wiring diagram and parameter setup menu of FUJI G11UD Transducer

（1） Wiring diagram of transducer terminals



（2） Setting transducer parameters as table below (for reference only): multi-segment

Parameters	Names	Setting values	Comments
F01	Frequency setting 1	0	
F02	Selection of running instrument	1	
F03	Maximum output frequency 1	50Hz	
F04	Basic frequency 1	50Hz	
F05	Rated voltage 1	380V	
F06	Maximum voltage 1	380V	
F07	Acceleration time 1	0.01S	
F08	Deceleration time 1	0.01S	
F15	Frequency upper limit	50Hz	Setting according to the given analog voltage maximum and elevator speed
F16	Frequency lower limit	0 Hz	
F17	Setting proportional frequency of	*	Setting proportional frequency of analog input

	analog input		
F18	Analog setting frequency offset	0	
F23	Start-up frequency	0.4Hz	
Parameters	**Names**	**Setting values**	**Comments**
F24	Run time of start-up frequency	0.3s	
F25	Stopping frequency	0.1Hz	
F26	Switching frequency	15KHz	
F27	Motor timbre	0	
F36	30Ry action mode	0	
F40	Torque limitation 1 (electric)	200	
F41	Torque limitation1 (braking)	200	
E01	Function selection of terminal X1	0	
E02	Function selection of terminal X2	1	
E03	Function selection of terminal X3	2	
E04	Function selection of terminal X4	4	
E05	Function selection of terminal X5	7	
E09	Function selection of terminal X9	9	Setting 4 when 7.5KW
E10	Acceleration time 2	0.01s	
E11	Deceleration time2	0.01s	
E12	Acceleration time 3	0.01s	
E13	Deceleration time 3	0.01s	
E14	Acceleration Time 4	0.01s	
E20	Selection of Y1 terminal function	7	
E21	Selection of Y2 terminal function	34	
E22	Selection of Y3 terminal function	37	
E23	Selection of Y4 terminal function	1	
E25	Y5 action method	0	
E33	Overload (OL) action selection	1	
E34	Overload (OL) action value	P06×0.05	
E35	Overload (OL) action time	0.2 S	
E46	Setting language	1	
C05	Multi speed 1	*	terminal landing creep speed (setting as the actual requirement)
CO6	Multi speed 2	*	Inspection traveling speed (setting as the actual requirement)
CO7	Multi speed 3	*	Creep speed (setting as the actual requirement)
C10	Multi speed 6	*	Medium speed (setting as the actual requirement)
C11	Multi speed 7	*	High speed (setting as the actual requirement)
C31	Analog input deviation	0	

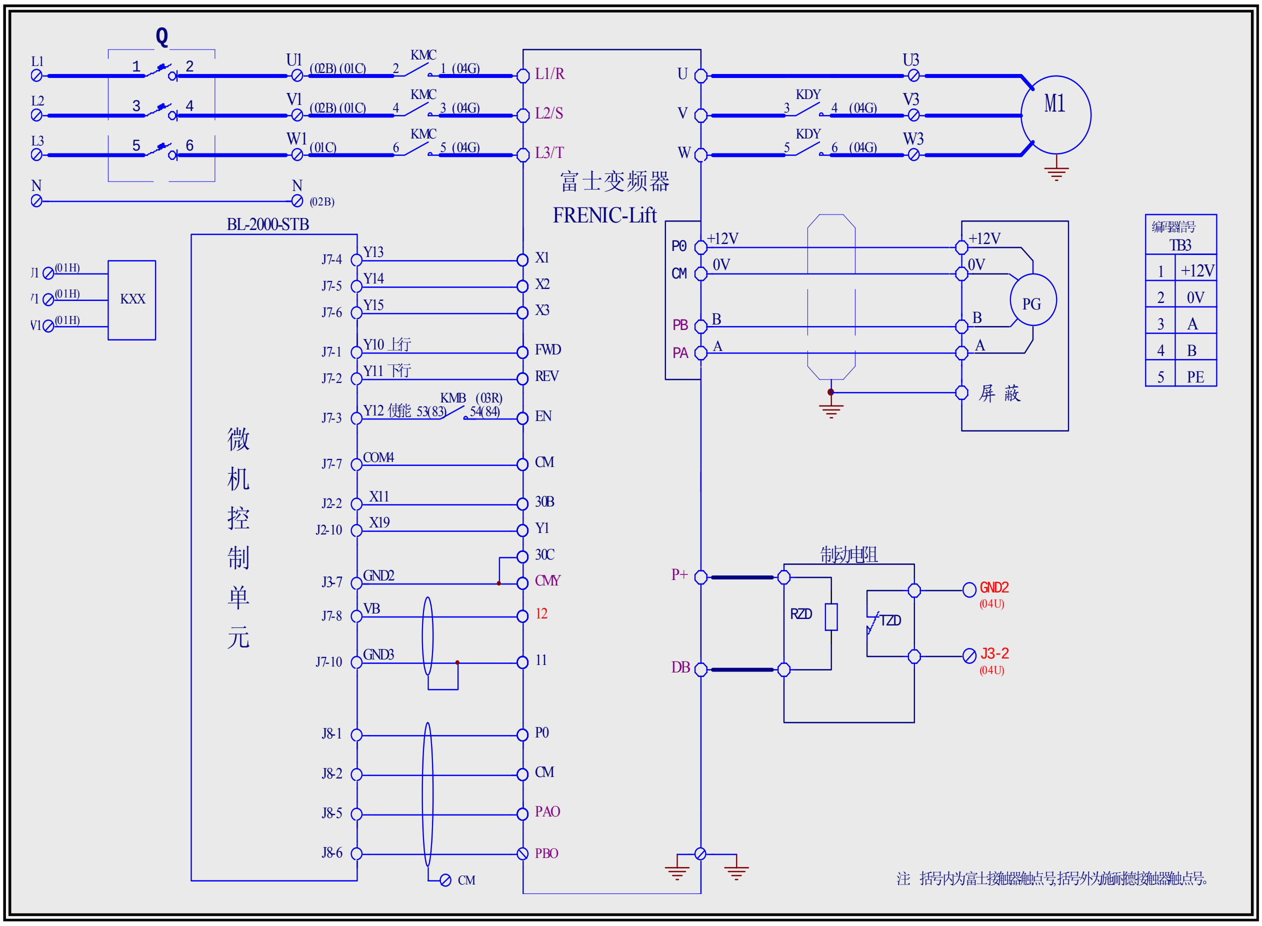
	adjustment		
P01	Motor pole numbers	*	Setting as motor nameplate
P02	Motor power	*	Setting as motor nameplate
P03	Motor rated current	*	Setting as motor nameplate
P06	Motor no-load current	*	Setting as default value
P09	Motor rated slip	note	
H11	Deceleration mode	1	
H18	Torque control	3	Torque offset of terminal 12
O01	Selection of velocity instrument mode	1	Required to set 1
Parameters	**Names**	**Setting values**	**Comments**
O02	Velocity instrument filter time constant	0.020	
O03	Encoder pulse numbers	*	Setting as practical configuration
O04	ASR P constant (high speed)	20	
O05	ASR I constant	0.1	
O06	Velocity feedback filter time constant	0.003	
O07	ASR P constant switching frequency 1	5	
O08	ASR P constant switching frequency 2	10	
O09	ASR P constant (low speed)	20	
O10	Multi-segment velocity instrument consistent timing	0.005S	S-type curve when finishing medium acceleration
O13	S-type curve setting 1	*	S-type curve when beginning acceleration (setting according to requirements)
O16	S-type curve setting 4	*	S-type curve when finishing medium speed acceleration (setting according to requirements)
O17	S-type curve setting 5	*	S-type curve when beginning medium speed deceleration (setting according to requirements)
O18	S-type curve setting 6	*	S-type curve when finishing high speed acceleration (setting according to requirements)
O19	S-type curve setting 7	*	S-type curve when beginning high speed deceleration (setting according to requirements)
O20	S-type curve setting 8	*	S-type curve when finishing deceleration (setting according to requirements)
O21	S-type curve setting 9	*	(Setting according to requirements)

O22	S-type curve setting 10	*	(Setting according to requirements)
O37	Torque instrument filter time constant	0.0	
O38	Start-up time	0.3	
C31	Analog input deviation adjustment (terminal 12)	0	
C32	Deviation adjustment	0	
C33	Analog input filter	0.05	
H18	Torque control	3	Torque offset of terminal /2

△Note: Motor rated slip frequency= basic frequency × $\dfrac{\textbf{Synchronous speed – rated speed}}{\text{Synchronous speed [r/min]}}$ **[Hz]**

5. Wiring diagram and parameter setup menu of FUJI FRENIC-LIFT transducer

(1) Wiring diagram of transducer terminals



(2) Setting transducer parameters as table below (for reference only): multi-segment

Parameters	Names	Setting value	Comments
F01	Speed setting	0	Multistep speed instrument with S curve acceleration and deceleration(SS1,SS2,SS4)

F03	Maximum speed	*	Setting as motor nameplate
F04	Rated speed	*	Setting as motor nameplate
F05	Rated voltage	380V	
F07	Acceleration and deceleration time 1	3.5S	Low speed acceleration time
F08	Acceleration and deceleration time 2	2.1S	Low speed deceleration time
F23	Starting speed	0.4Hz	
F24	Duration time	0.3s	
F25	Stopping speed	0.1Hz	
F42	Control selection	0	With PG vector control (asynchronous motor)
E01	Function selection of terminal X1	0	
E02	Function selection of terminal X2	1	
E03	Function selection of terminal X3	2	
E10	Acceleration and deceleration time 3	3.5s	Low speed acceleration time
E11	Acceleration and deceleration time 4	2.5s	Medium speed deceleration time
E12	Acceleration and deceleration time 5	3.5s	High speed acceleration time
Parameters	Names	Setting values	Comments
E13	Acceleration and deceleration time 6	2.0s	High speed deceleration time
E14	Acceleration and deceleration time 7	11s	Creep deceleration time
E18	Multi-level speed instrument consistent timer	2	
E19	Multi-level speed instrument consistent timer time	0.010	
E20	Function selection of terminal Y1	35	Transducer output
E27	Terminal 30A/B/C (relay output)	99	Integral alarm
E48	LED monitor detailed content	2	Speed setting
E61	Terminal 12 (function selection)	4	Torque offset instrument
C05	Multi-segment speed1	8	terminal landing creep speed (unit: HZ)
C06	Multi-segment speed 2	8	Inspection traveling speed
C07	Multi-segment speed 3	3	Creep speed
C10	Multi-segment speed 6	30	Medium speed
C11	Multi-segment speed 7	45	High speed
C31	Analog input deviation adjustment (terminal 12)	0	
C32	Analog input gain adjustment	100％	

	(terminal 12)		
C33	Analog input filter adjustment (terminal 12)	0.05s	
P01	Motor pole numbers	*	Setting as motor nameplate
P02	Motor capacity	*	Setting as motor nameplate
P03	Motor rated current	*	Setting as motor nameplate
P06	Motor no-load current	*	Setting as default value
P12	Motor rated slip	noting	
L01	Pulse programmer (selection)	2	A, B phases ： 12, 15V complement, oc, 5Vcable-driven.
L02	Pulse numbers	*	Setting as practical configuration
L19	S-shaped setting 1	20	S-type curve when beginning acceleration
L22	S-shaped setting 4	20	S-type curve when finishing medium speed acceleration
L23	S-shaped setting 5	20	S-type curve when beginning medium speed deceleration
L24	S-shaped setting 6	20	S-type curve when finishing high speed acceleration
L25	S-shaped setting 7	16	S-type curve when beginning high speed deceleration
L26	S-shaped setting 8	18	S-type curve when finishing deceleration
L27	S-shaped setting 9	30	
L28	S-shaped 10	30	
L36	P constant when high speed	8	
L37	I constant when high speed	0.5s	
L38	P constant when low speed	10	
L39	I constant when low speed	0.5s	
L40	Switching speed 1	5HZ	
L41	Switching speed 2	10HZ	
L60	Torque offset driving side gain	50％	Setting as spot actual value
L61	Torque offset braking side gain	50％	Setting as spot actual value

Notes: Motor rated slip frequency = basic frequency × $\dfrac{\text{Synchronous speed} - \text{Rated speed}}{\text{Synchronous speed [r/min]}}$ [Hz]

Self-tuning implementation:

1、Set 1 or 2 in the function code P04, and press DATA key. (Flashing displayed by 1 or 2 can turn slow.)

2、Input the running instrument of determined rotation direction.

3、Lighten the display of 1 or 2, and begin self-tuning. (Self-tuning time: maximum value is about 15 seconds when P04=1, and maximum value is about 15 seconds when P04=1)

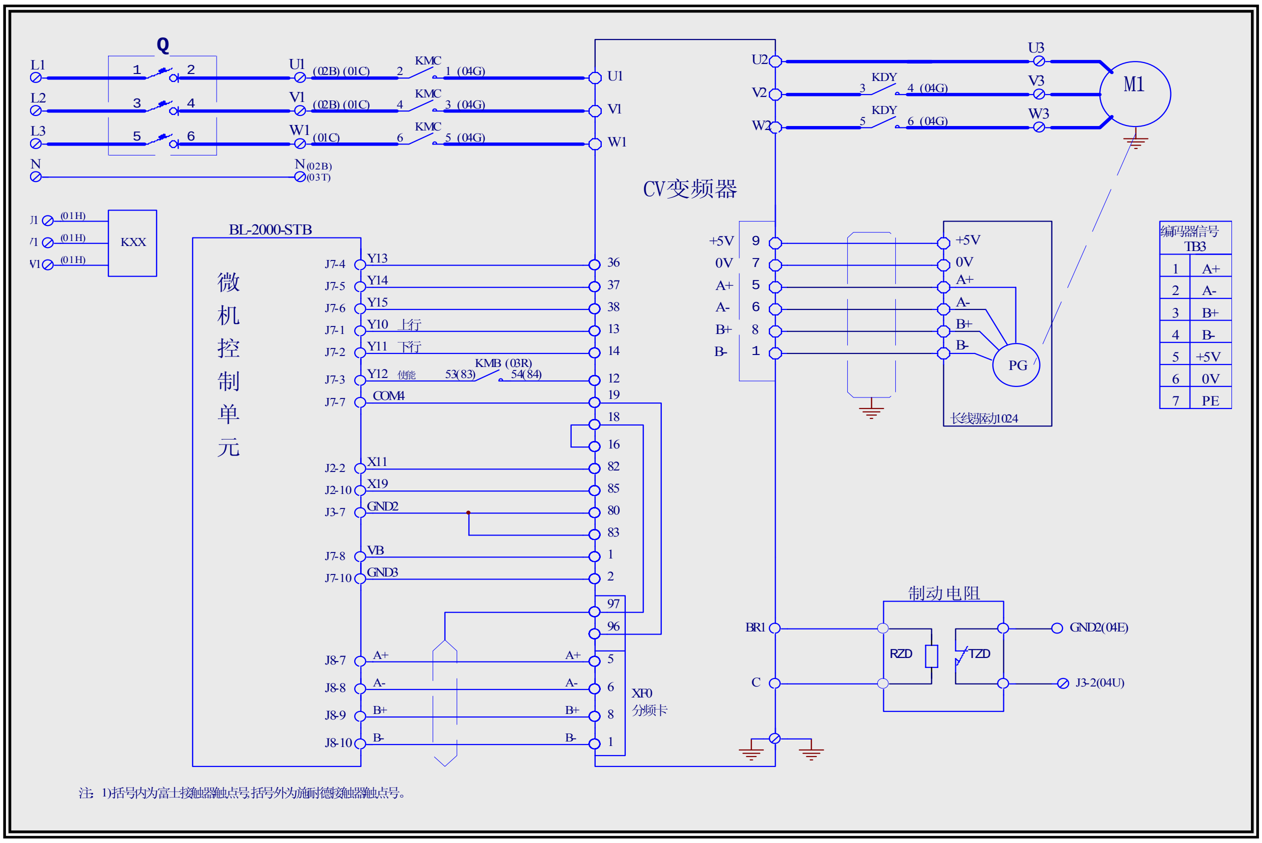
4、Display end when determination is over.

5、Set running instrument as OFF, then self-tuning is over. Operation panel will display next function code (P06).

Motor constants after self-tuned will be saved automatically, respectively once resistance %R1 is P07, leaking reactance %X is P08, no-load current is P06, and rated slip is P12.

6. Wiring diagram and parameter setup menu of SIEI Transducer

(1) Wiring diagram of transducer terminals



(2) Setting transducer parameters as table below (for reference only): multi-segment

Notes: Standard and type of transducers should be AVy…AC/AC4, wherein, ellipsis part should be transducer power

Encoders are set by jumpers S11—S17 which should be set as OFF

Speed setup as below

Items	Terminals			Speed values
	38	37	36	
Self learning speed	0	0	1	200mm/s
Inspection traveling speed	0	1	0	200mm/s
Creep speed	0	1	1	50 mm/s
Speed 4	1	0	0	0 mm/s
Speed 3	1	0	1	0mm/s
Speed 2	1	1	0	800mm/s
Rated speed V_1	1	1	1	1000mm/s

Debugging steps:

1：Check wiring of transducer main circuit and control circuit again to avoid damaging transducer after finishing wiring; and check wiring connection. Check whether the output lines U V W and the motor lines U V W are corresponding.

2：After the careful examination, set parameters and then run the idle operation.

3：In the case of normal running of idle operation, put the elevator into the normal operation state, and run the normal operation to check whether the backward sliding or overshooting will happen when the elevator is in the up and down motion, if the back sliding exists then increase the pretorque function.

4：When both normal and idle operations are normal, adjust S curve parameters and P, I parameters to set the comfortable degree of high-speed elevator.

1： Motor data

Parameters	Setting values	Comments
Rated voltage	380V	
Rated frequency	50HZ	*
Rated current	23.5A	*
Rated speed	1440pm	
Rated power	11KW	*
Cosfi	0.85	*
Efficiency	96%	*

2：self learning

See the subsequent motor current self-learning steps.

3： hoist machine data

Parameters	Setting values	Comments
Speed units selection	Millimeters	
deceleration ratio	2	
Hoist wheel diameter	410mm	*
Maximum speed scale	150rpm	*

4： Car weight data

Parameters	Setting values	Comments
Car weight	2100kg	*
Counter weight	2900kg	*
Maximum load weight	1600kg	*
Rope weight	300kg	*
Motor inertia	5.0	*
gearbox inertia	0.0	*

5： Encoders data

Parameters	Setting values	Comments
Encoder type	0 (Std encoder)	
Standard encoder type	Digital	
Standard encoder pulses	1024pps	
Standard encoder mode	0(FP)	
Standard encoder supply	0 (5.14V)	

6： Braking unit data

Parameters	Setting values	Comments
Braking unit control	1 (internal)	
Braking resistance	15Ω	*

Braking unit resistance power	8.0KW	*

7： Control mode parameter

C	Setting values	Comments
Control mode selection	Field oriented	

8：Multi-segment speed parameter

Parameters	Setting values	Comments
Smooth start speed	0	
Self-learning speed (Multi speed 1)	200mm/s	
Inspection traveling speed (Multi speed 2)	200mm/s	
Creep speed (Multi speed 3)	50 mm/s	
Speed 4 (Multi speed 4)	0mm/s	
Speed 3 (Multi speed 5)	0mm/s	
Speed 2 (Multi speed 6)	800mm/s	
Rated speed (Multi speed 7)	1000mm/s	

9： Ramp curve parameter

Parameters	Setting values	Comments
Initial jerk acceleration (MR0 acc ini jerk)	300 mm/s^3	
Acceleration (MR0 acceleration)	600 mm/s^2	
End jerk acceleration (MR0 acc end jerk)	500 mm/s^3	
Initial jerk deceleration (MR0 dec ini jerk)	500 mm/s^3	
Deceleration (MR0 deceleration)	600mm/s^2	
End jerk deceleration (MR0 dec end decel)	500mm/s^3	
Ending deceleration (MR0 end decel)	200mm/s^2	

10： Elevator time sequence parameter

Parameters	Setting values	Comments
Contactor close delay	304ms	
Brake open delay	416ms	
Smooth start delay	400ms	
Brake close delay	3000ms	
Contactor open delay	200ms	

11： Speed P1 parameter

Parameters	Setting values	Comments
SpeedP1 gain%	20%	
Speedl1 gain%	3.3%	
SpeedP2 gain%	20%	
Speedl2 gain%	5%	
Speedl3 gain%	12%	
Speed 0 enable	2(Enable as start)	
Speed 0 P gain%	19%	

Speed 0 I gain%	20%	
filter time		

12： Speed threshold parameter

Parameters	Setting values	Comments
Spd 0 ref thr	1rpm	
Spd 0 ref delay	3000ms	
Spd 0 speed thr	1rpm	
Spd 0 spd delay	3000ms	
SGP tran21 h thr	94%	
SGP tran32 l thr	5%	
SGP tran21 band	4%	
SGP tran 32 band	4%	

13： Speed PI regulator parameter

Parameters	Setting values	Comments
Speed P base value	50A/rpm	
Speed I base value	8000A/rpm	

14：

Parameters	Setting values	Comments
TRAVEL\Ramp function	Using default value	
TRAVEL\Ramp setpoint	Using default value	
TRAVEL\ Speed setpoint	Using default value	

Notes: Parameters with * mark are set according to actural conditions.

7、Parameter setup menu of WVF5 Asynchronous System Equipping YASKAWA L7B Transducer(Multi-segment)

Setting steps of transducer parameters:

1. First use “initialization” parameter A1-03=2220, then initialize the transducer parameters.
2. Set “control mode” parameter A1-02=3.
3. Setting transducer parameters as table below (multi segment for reference only): set o1-03=motor pole numbers，o1-04=1display revolutions.

Parameters	**Names**	**Setting values**	**Comments**
A1-00	Display language selection of digital manipulator	0	English (default value)
A1-01	Parameter access level	2	ADVANDCED
A1-02	Selection of control mode	3	With PG vector
B1-01	Selection of frequency instruction	0	Digital manipulator
B1-02	Selection of running instruction	1	control circuit terminal (sequence control)

B1-03	Selection of stop method	1	Free running stop
B1-06	Twice reading time selection of control terminal	0	2ms
C1-01	Acceleration time 1	2	Setting with the unit of second Acceleration time from 0％ to 100 % of maximum output frequency
C1-02	Deceleration time 1	2	Setting as the unit of second Deceleration time from 100％ to 0 % of maximum output frequency
C1-08	Deceleration time 4	3～5	Lower than deceleration time under C1-11 frequency
C1-11	Switching frequency of acceleration and deceleration time	*	Be consistent with setup of d1-04
C2-01	S characteristic time when beginning acceleration	0.7	
C2-02	S characteristic time when finishing acceleration	0.7	
C2-03	S characteristic time when beginning deceleration	0.7	
C2-04	S characteristic time when finishing deceleration	0.7	
C5-01	AASR proportion gain 1	10	
C5-02	ASR integral time 1	0.35	
d1-02	Frequency instruction 2	0	Self learning speed (setting as practical requirement)
d1-03	Frequency instruction 3	200	Inspection traveling speed (setting as practical requirement)
d1-04	Frequency instruction 4	30	Creep speed (setting as practical requirement)
d1-05	Frequency instruction 5	*	Low speed (V1) (setting as practical requirement)
d1-06	Frequency instruction 6	*	Medium speed 1 (V2) (setting as practical requirement)
d1-07	Frequency instruction 7	*	Medium speed 2 (V3) (setting as practical requirement)
d1-08	Frequency instruction 8	*	High speed (V4) (setting as practical requirement)
E1-01	Transducer input voltage	380	Unit: V
E1-04	Maximum output frequency/revolutions	*	This parameter is the same as E1-06
E1-05	Maximum voltage	*	Setting as motor nameplate
E1-06	Basic frequency/revolutions	*	Setting as motor nameplate
E1-09	Minimum output frequency/revolutions	0	
E2-01	Motor rated current	*	Setting as motor nameplate, paying attention to

			units

Parameters	Names	Setting values	Comments
E2-02	Motor rated slip	*	Using equation to calculate slip according to rated speed
E2-03	Motor idle current	*	35%-40% of rated current
E2-04	Motor pole number	*	Setting as motor nameplate
E2-11	Motor Rated capacity	*	Motor power
F1-01	P PG Pulse	*	Setting as actual encoder
F1-03	Action selection when overspeed	0	
F1-04	Action selection when detection of oversize velocity deviation	0	
F1-08	Overspeed detection standard	105	
F1-09	Overspeed detection delay time	1	
F1-10	Detection standard when oversize velocity deviation	30	
F1-11	Detection relay time when oversize velocity deviation	1.0	
H1-01	Function selection of terminal S3	24	Multifunction contact input 1
H1-02	Function selection of terminal S4	14	Multifunction contact input 2
H1-03	Function selection of terminal S5	3	Multifunction contact input 3
H1-04	Function selection of terminal S6	4	Multifunction contact input 4
H1-05	Function selection of terminal S7	5	Multifunction contact input 5
H2-01	Function selection of terminal M1-M2	37	
H3-15	Function selection of terminal A1	1	Torque compensation
H3-16	Input gain of terminal A1	120%	Setting according to the spot
H3-17	Input offset of terminal A1	0	
L3-04	Stall prevention function selection when deceleration	0	
L8-07	Selection of output side open-phase protection	1	
o1-01	Displaying item selection in driving mode	5	Selecting the monitoring item number required to display under the driving mode
o1-02	Monitor displaying item selection when supply is ON	1	Setting monitoring frequency instruction
o1-03	Unit selection of frequency instrument setting/ displaying	*	Setting as motor pole number
o1-04	Setting unit of frequency instrument relative parameters	1	Displaying revolutions
S1-20	Zero servo gain	*	Setting according to the spot
S1-24	Torque compensation offset in up motion	-60%	Setting according to the spot

S1-25	Torque compensation offset in down motion	-60%	Setting according to the spot

* Adjustment methods of starting torque compensation are as below:

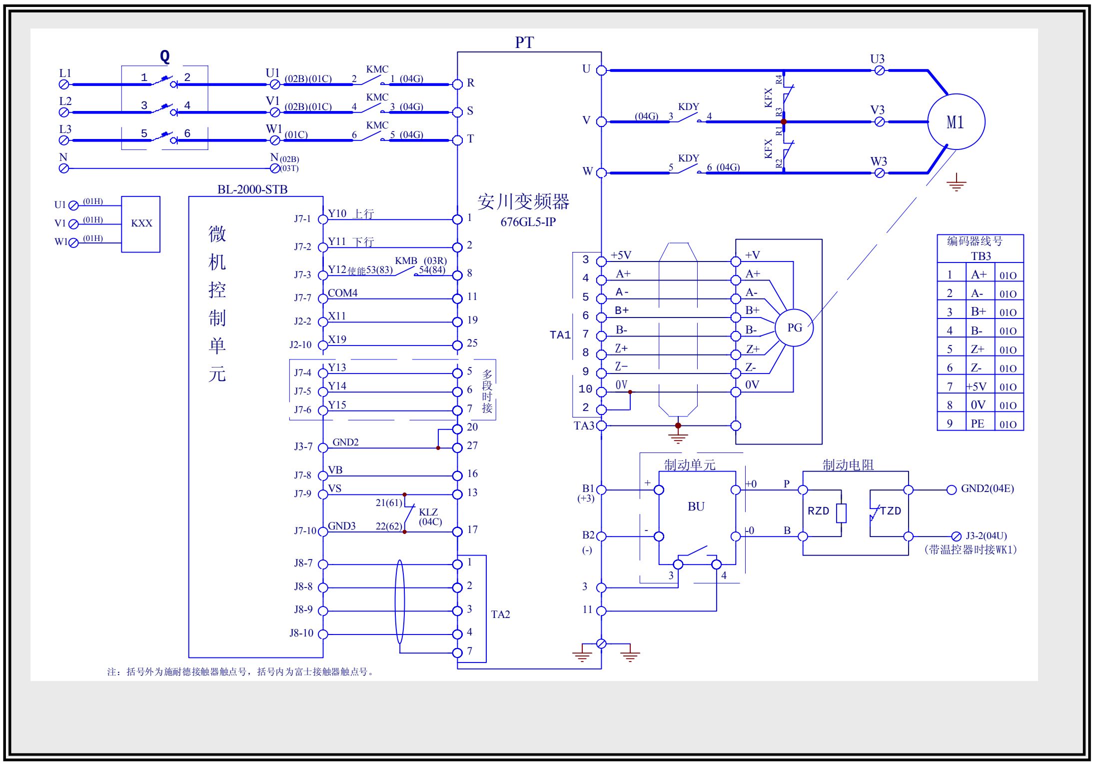
1. **Parameter H3-15=1, terminal A1 of analog input is 0～10V.**
2. **Parameter H3-17=0.**
3. **Adjust parameters S1-24, S1-25 (adjust to negative direction) when idling until both up and down motion without backward sliding.**

   Notes: S1-24 and S1-25 generally adopt same values, for example set as -60%.
4. **H3-16=2×(S1-24), for example set as 120%.**

Appendix 2 Connection Diagram and Parameter Settings List of the Inverter Selected for Synchronous Motor Control

1. Connection Diagram and Parameter Settings List of Yasukawa 676GL5-IP Inverter

（1） Connection Diagram of Inverter Terminal



安川变频器	YASKAWA inverter
微机控制单元	Computer control unit
多段时接	Connected in the case of multi sections
编码器线号	Encoder line number
制动单元	Brake unit

制动电阻	Brake resistor
带温控器时接 WK1	Connected to WK1 in the case of with thermostat
注: 1) 括号内为富士接触器触点号, 括号外为施耐德接触器触点号	Note: the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor

（2） Key Instructions

DRIVE/PRGM key: enter or exit setstate.

"＞" key: select and reset.

"∧" and "∨" keys: change number.

DSPL key: return to previous menu and switch between the monitored items in running. 。

（3） Setting

- ◆ Initializing inverter parameters by using "Initialized" parameter A1-03=2220.
- ◆ Setting A1-01 to 686 and A1-04 to 686.
- ◆ Setting A1-02 to 5 and inverter to synchronous control mode.
- ◆ Setting inverter parameters according to the following table (for reference only): simulation + multi-segment

Parameter	Description	Setting value	Note
A1-06	Input voltage	380	
O1-01	Selection of monitored item	1	
O1-02	Monitoring O1-01selection item	4	
O1-03	Speed instruction display unit	*	Poles number of motor
B1-01	Speed instruction selection	1	Set to "0" at multi speed
B1-02	Running instruction selection	1	
B1-03	Stop method selection	0	
B1-04	Inversion inhibit selection	0	
B2-01	Zero speed level	1	
C1-01	Acceleration time 1	2	
C1-02	Deceleration time 1	2	
C1-03	Acceleration time 2	2	
C1-04	Deceleration time 2	2	
C2-01	S-curve characteristic time at acceleration start	0	Set to 1.5 in the case of multi speed (for reference)
C2-02	S-curve characteristic time at acceleration end	2	Set to 1.5 at multi speed (for reference)
C2-03	S-curve characteristic time at deceleration start	2	Set to 1.5 in the case of multi speed (for reference)
C2-04	S-curve characteristic time deceleration end	0	Set to 1.5 in the case of multi speed (for reference)
C5-01	ASR proportional gain 1	5	
C5-02	ASR integration time 1	1	
C5-03	ASR proportional gain2	7	
C5-04	ASR integration time2	0.8	
C5-08	ASR filtering	0	

C5-09	ASR switching speed	30	
D1-02	Frequency instruction2	0	Self-learning speed in the case of multi speed (set according to actual need)
D1-03	Frequency instruction3	0	Inspection traveling speed in the case of multi speed (set according to actual need)
D1-04	Frequency instruction4	0	Creep speed in the case of multi speed (set according to actual need)
D1-05	Frequency instruction5	0	Low speed in the case of multi speed (V1) (set according to actual need)
D1-06	Frequency instruction6	0	Medium speed in the case of multi speed (V2) (set according to actual need)
D1-07	Frequency instruction7	0	Medium speed in the case of multi speed (V3) (set according to actual need)
D1-08	Frequency instruction8	0	High speed in the case of multi speed (V4) (set according to actual need)
D1-09	Inching instruction	200	
E3-10	Motor d (D) axis inductance	*	See nameplate
E3-11	Motor q (Q) axis inductance	*	See nameplate
E3-12	Induced voltage parameter of motor	*	See nameplate
E3-13	Mechanical loss of motor	*	See nameplate
E3-14	Connection resistance of motor	*	See nameplate
E3-18	PG origin pulse compensation	*	Establishment of PG self-learning
E3-23	Magnetic torque coefficient K1	*	
E3-24	Rated torque coefficient K2	*	
E2-26	De-vibration compensation loop effective	1	
E2-29	Electrical mechanical time constant	0.056	
E2-30	P value of compensation loop	0.2	
E2-31	I value of compensation loop	0.05	
Parameter	**Name**	**Set value**	**Notes**
E2-32	Filtering time constant 1	0.004	
E2-33	Filtering time constant 2	0.396	
F1-01	PG constant	*	Set according to coder
L5-01	Abnormal reset and restart times	5	
L8-05	Input-side lack-phase protection action selection	1	
L8-07	Output-side lack-phase protection action selection	1	
H1-03	Function selection of terminal 5	F	Set to “3” in the case of multi speed
H1-04	Function selection of terminal 6	F	Set to “4” in the case of multi speed
H1-05	Function selection of terminal 7	6	Set to “5” in the case of multi speed
H1-06	Function selection of terminal 8	9	

H2-01	Function selection of terminal 9	37	
H2-02	Function selection of terminal 25	37	Set to “40” when using torque compensation
H3-01	Level selection of terminal 13	0	
H3-02	Input gain of terminal 13	*	Set according to analog voltage max and elevator speed
H3-03	Input offset of terminal 13	0	
H3-04	Level selection of terminal 16	1	
H3-05	Function selection of terminal 16	14	
H3-06	Input gain of terminal 16	0	
H3-07	Input offset of terminal 16	0	
H3-12	Analog input filtering time	0.02	
S1-10	Starting torque compensation offset for rising	0	
S1-11	Starting torque compensation offset for descending	0	
S1-12	Accelerated moment compensation filtering time	0	
S1-13	Accelerated moment compensation gain	0	

▲Notes: Upon finishing parameter setting, if the “OPE11” is displayed on frequency inverter, reduce parameter C6-04 at the interval of 2.

（4） The inverter can get the parameters of motor according to the motor nameplate or through the self-learning. Firstly, set up the basic parameters of the motor: max speed of revolution, basic speed of revolution, number of poles, rated voltage and rated current, then observe the negative rotating (positive rotating) motor on Pulley side to see if the direction feedback from parameter U1-05 is positive, if not, change by negating parameter F1-02. Motor must be in no-load state when self-learning through:

- ◆ Setting the parameter T1-01 of inverter to 2 (full self-learning)
- ◆ Pressing DSPL key to return to T1-01 display
- ◆ Pressing DRIVE/PRGM key to display CAL 12
- ◆ Pressing RUN key to display CAL13 (blink), motor is self-learning.
- ◆ Displaying END for about 2 seconds to automatically return to monitoring state to finish self-learning.

To ensure the correctness of PG origin pulse compensation, PG origin pulse must conduct single-item self-learning at no load condition of motor through:

- ◆ Setting the parameter T1-01 of inverter to 3
- ◆ Press DSPL key to return to T1-01 display
- ◆ Press DRIVE/PRGM key to display CAL 12
- ◆ Pressing RUN to display CAL 13 (blink), inverter is self-learning
- ◆ Displaying END for about 2 seconds to automatically return monitoring state to finish self-learning
- ◆ Taking down parameter E3- 18, PG origin pulse compensation

（5） FAQ in trial running:

- ◆ Elevator jitters and speed is unstable. Please check the connection between rotation encoder and motor. If no connection problem, it may be because the poor performance of rotation encoder.
- ◆ Speed is too low. If the elevator is running in the direction as displayed on inverter but the speed feedback value is not consistent with the speed given with great difference, please check if the parameters of the inverter are set correctly. The following table is given for your reference.

◆ No speed feedback. It may be because of the output damage of rotation encoder or the problem with the connecting cable.

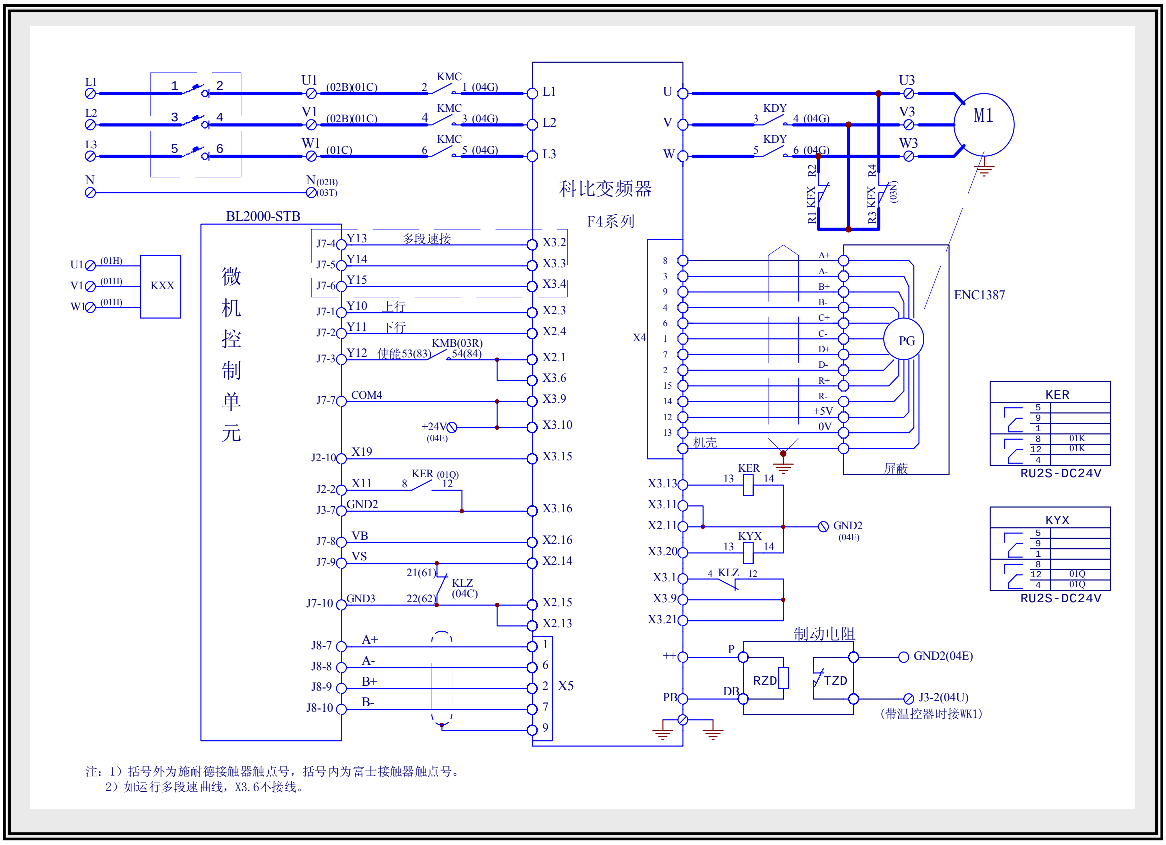
Yasakawa 676GL5-IP			
Rated voltage	E1-01	Rated current of motor	E2-01
Max output frequency	E1-04	Slip frequency of motor	E2-02
Max output frequency voltage	E1-05	Motor poles	E2-04
Basic frequency	E1-06	Encoder pulse count	F1-01
Inspection speed	D1-09		

▲Note: Do not let inverter drive motor to run for long when elevator can't running normally!

2．KEB F4 Inverter Connection Diagram and Parameter Setting 3.0 Version

（1） Inverter terminal connection diagram

(2) Set inverter parameters according to the following table (reference only):



科比变频器	KEB inverter
F4 系列	F4 series
多段速时接	Connected in the case of multi speed
上行	Up
下行	Down
使能	Enable
微机控制单元	Computer control unit
机壳	Case
屏蔽	Shielded
制动电阻	Brake resistor
带温控器时接 WK1	Connect to WK1 in the case of with thermostat
注: 1)括号内为富士接触器触点号，括号外为施耐德接触器触点号	Notes: 1) the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor.
2) 如运行多段速曲线,X3.6 不接线.	2) Not connect X3.6 if running multi speed curve.

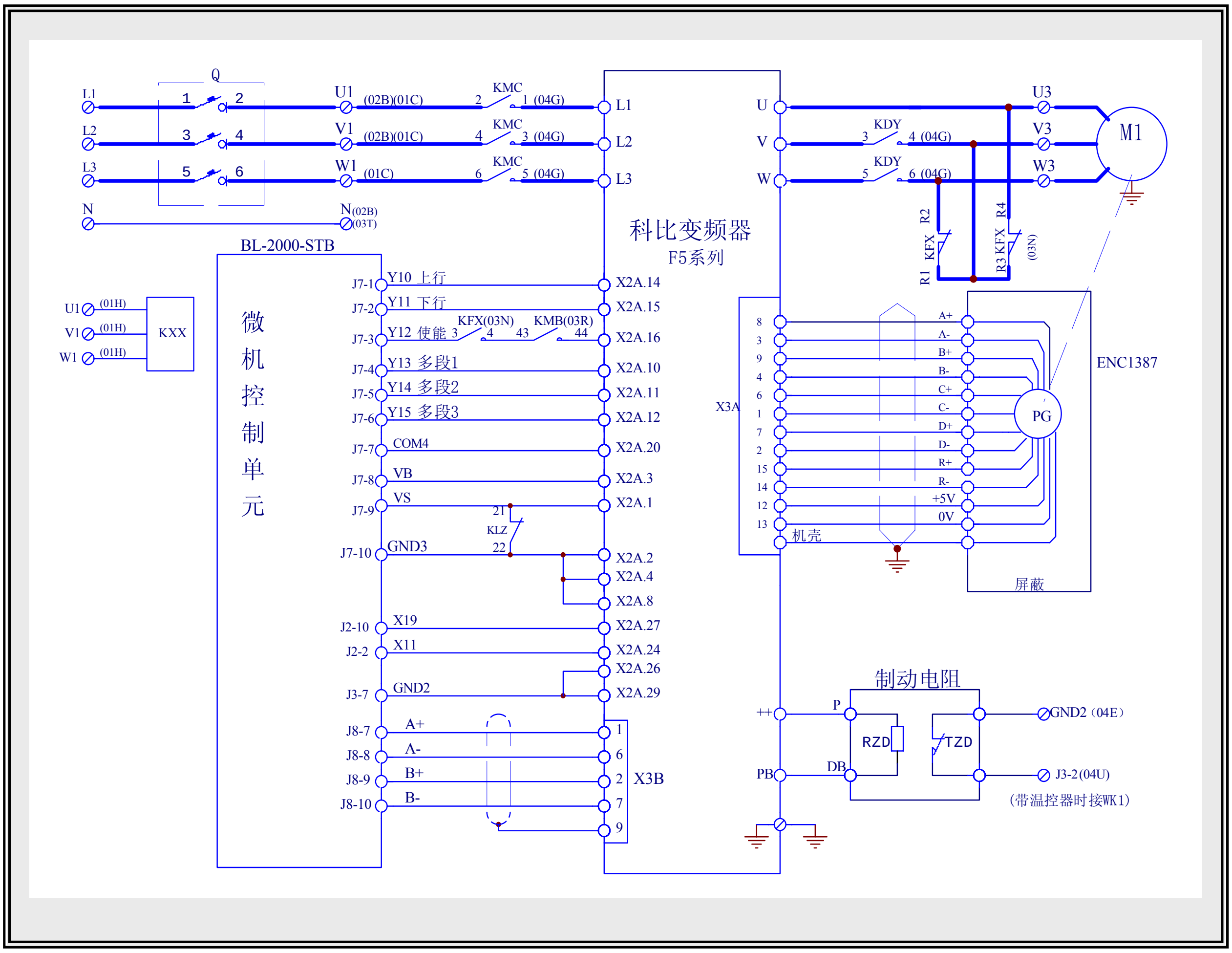
Parameter	Description	Setting value	Note
dr.00	Rated power of motor	*	See nameplate
dr.01	Rated speed	*	See nameplate
dr.02	Rated current	*	See nameplate
dr.03	Rated frequency	*	See nameplate

dr.07	Stator current	1.1×dr.02	See nameplate
dr.09	Rated torque of motor	*	See nameplate
dr.17	Opposing electromotive force	*	See nameplate
dr.41	Winding resistance	*	See nameplate
dr.42	Winding inductance	*	See nameplate
EC01	Encoder pulse count	*	See nameplate
EC03	Encoder pole-pairs	0	See nameplate
EC04	System position adjustment	7	
EC06	Encoder model class	1	
EC07	System location		
EC17	Frequency division coefficient	1	
LF.00	Password	-4	
LF.01	User password	440	
LF.02	Operation mode	3	
LF.04	Motor selection	1	
LF.05	Operating direction adjustment	OFF	
LF.06	High resolution	1	
LF.20	Rated elevator speed		Set up according to actual field parameters
LF.21	Pulley diameter		Set up according to actual field parameters
LF.22	PM reduction ratio	OFF	Set up according to actual field parameters
LF.23	Hoist rope reeving mode	2	Set up according to actual field parameters
LF.24	Carrying capacity		
LF.30	Control mode	3	Speed feedback and pre-control torque closed loop
LF.36	Max torque	Rated torque×1.5	DR09×1.5
LF.38	Modulation frequency transformation	0	
LF.41	Opening speed	0.5	7.5kw
LF.44	Opening speed	0.5	
LF.50	Abrupt acceleration	0.5	
LF.51	Acceleration	1.5	
LF.52	Abrupt deceleration	2.5	
LF.53	Deceleration	2.0	
LF.54	Stop slope	OFF	
LF.60	Braking speed	0.010	
LF.61	Overspeed monitoring	1.1×LF20	
LF.62	Deceleration monitoring	0.010	
LF.63	Creeping monitoring	0.25	
LF.65	Overheat delay time	300	
LF.66	Radiator temperature monitoring	40	
LF.67	Pre-torque gain	1	
LF.68	Pre-torque offset	0	
LF.69	Pre-torque direction	OFF	
LF.70	Brake open time	0.3	
LF31	Speed proportion	1500	Typical value

LF32	Speed integrator	125	Typical value
LF33	KI Speed-Offset	1875	Typical value
LF34	Current proportion	980	Typical value
LF35	Current integrator	160	Typical value

3．KEB **F5 Inverter Diagram and Parameter Setting**

（1）Inverter Terminal Connection Diagram



科比变频器	KEB inverter
F5 系列	F5 series
上行	Up
下行	Down
多段 1	Multi speed 1
多段 2	Multi speed 2
多段 3	Multi speed 3
使能	Enable
微机控制单元	Computer control unit
机壳	Case
屏蔽	Shielded
制动电阻	Brake resistor
带温控器时接 WK1	Connect to WK1 in the case of with thermostat

（2）**Set the parameters of inverter according to the following table (reference only):　multi-segment**

Name	Parameter	hexadecimal address:	Recommended value
CP.0	Password	1000	Read only
		2000	Read-write
CP.1	PM Rated Current	0617	See motor nameplate
CP.2	PM Rated Speed	0618	See motor nameplate
CP.3	PM Rated Frequency	0619	See motor nameplate
CP.4	PM EMF Voltage Constant	061A	See motor nameplate
CP.5	PM Rated Torque	061B	See motor nameplate
CP.6	PM Winding Resistance	061E	See motor nameplate
CP.7	PM Winding Inductance	061F	See motor nameplate
CP.8	PM Torque Limit(Torque limit)	0621	
CP.9	Motor Adaption	090A	
CP.10	abs. torque ref	0F13	
CP.11	Speed V1	0P03	
CP.12	Speed V2 analog rated number	0P03	
CP.13	Speed V3	0P03	
CP.14	Speed V4	0P03	
CP.15	Speed V5	0P03	
CP.16	Speed V6	0P03	
CP.17	Speed V7	0P03	
CP.18	S-Curve Time acc	0P32	2.10S
CP.19	Acceleration Time	0P28	2.70S
CP.20	S-Curve Time dec	0P34	2.10
CP.21	Deceleration Time (deceleration time)	0P30	2.70S
CP.22	Premagnetizing Time	0423	1S
CP.23	Brake Release Time	0424	0.15S
CP.24	Brake Engage Time	0428	0.30S
CP.25	Switching Frequency	050B	4KHZ
CP.26	Encoder Pulse Number	1001	2048Inc
CP.27	Encoder Track Change	1006	0: OFF
CP.28	System Position	1002	2206
CP.29	KP Speed	0F06	2000
CP.30	KI Speed	0F09	1500
CP.31	KI Speed-Offset	0F0A	3500
CP.32	KP Current	1100	Motor self-adapting
CP.33	KI Current	1101	Motor self-adapting
	Indication Parameters only		
CP.34	Actual Speed(min^{-1})	0209	
CP.35	Apparent Current(A)	020F	
CP.36	Inverter State＝Start Display	0200	

Notes: add the following parameters setting in the case of simulation set:

Name	Parameter	Recommended value	Notes
AN0	Input voltage selection	0	0～10V
AN1	Analog collection times	1	2 times
AN2	Analog variable storage mode	0	Direct mode
AN4	Zero lag	0%	
AN5	Analog 1 input increment	1	
AN6	X-axis offset	0	
AN7	Y-axis offset	0	
0P.00	Operation instruction selection	0	Analog curve
		2	Multi speed given

(3) KEB F5 Self-learning:

Step1: CP.00: enter 200, press Enter to confirm;

Step 2: enter motor parameters

CP.01: motor rated current, press Enter to confirm;

CP.02: motor rated speed, press Enter to confirm;

CP.03: motor rated frequency, press Enter to confirm;

CP.04: EMF per 1000 rotations, press Enter to confirm;

CP.05: motor rated torque, press Enter to confirm;

CP.06: motor winding resistance, press Enter to confirm;

CP.07: motor winding inductance, press Enter to confirm;

Step 3: motor self-adapting

CP.09: enter 1, press Enter to confirm;

Step 4: CP.26: encoder lines, press Enter to confirm

Step 5: system location

CP.28: enter 2206, press Enter to confirm;

Step 6: add “Enable”;

Step 7: observe CP.35 until CP.35 value increase gradually from 0 to around the rated current and remain the same for around 30s, then self-learning is successful;

Step 8: disconnect “Enable”;

Notes: During self-learning, if E.Enc fault alarm occurs, find the reason in the following three aspects:

（1） Motor is not connected correctly, check the phase U, V and W connection of motor is strictly consistent with the phase U, V and W of inverter;

（2） The number of encoder line is not correct, check CP.26,

（3） Encoder cable is connected wrongly;

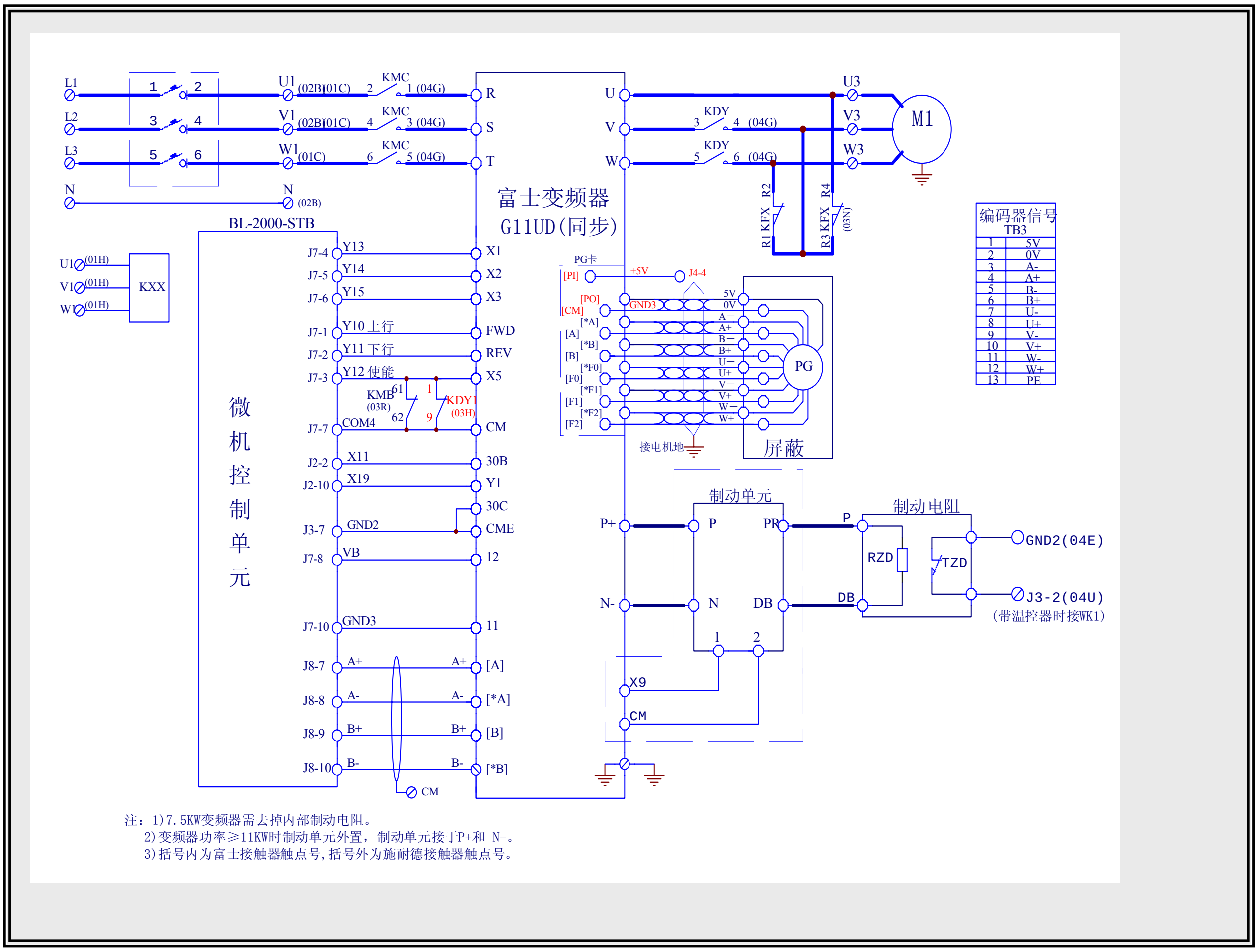
After correction, repeat Step 5 - 8,

Step 9: After self-learning is successful, set the corresponding speed in CP.11 - CP.17, then add “Enable”, direction and speed to start up.

Step 10: CP.00: enter“100”, press Enter to confirm, set CP parameters as Indication Parameters only to avoid rewriting without permission.

4. Fuji G11UD-4C4 Inverter Connection Diagram and Parameter Setting Table

（1） Inverter Terminal Connection Diagram



富士变频器 G11UD (同步)	Fuji inverter G11UD (synchronous)
编码器信号	Encoder signal
上行，下行	Up, Down
使能	Enable
微机控制单元	Computer control unit
屏蔽	Shielded
制动电阻	Brake resistor
带温控器时接 WK1	Connect to WK1 in the case of with thermostat
注: 1) 7.5W 变频器需去掉内部制动电阻	Notes: 1) The internal brake resistor of 7.5KW inverter needs to be removed.
2) 变频器功率≥11KW 时制动单元外置，制动单元接于 P+和 N-	2) when inverter power≥11KW, brake unit is external linked and connected to P+ and N-
2)括号内为富士接触器触点号，括号外为施耐德接触器触点号	3) The number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor.

（2） **Set up the parameters of inverter according to the following table (reference only): multi-segment + analog**

Parameter	Description	Setting value	Note	
F01	Selection of frequency set	0	Set to 1 in the case analog set	
F02	Operation instruction selection	1		
F03	Max output frequency 1	*	See motor nameplate	
F04	Basic frequency 1	*	See motor nameplate	
F05	Rated voltage 1	380	See motor nameplate	
F06	Max voltage 1	380	See motor nameplate	
F07	Acceleration time 1	3.5S	Inspection acceleration time	
F08	Deceleration time 1	1.00S	Inspection deceleration time	
F15	Frequency upper limit	*	Set up according to base frequency	
F16	Frequency lower limit	0 Hz		
F23	Start-up frequency	0Hz		
F24	Start-up frequency holding time	0.5s		
F25	Stop frequency	0.1Hz		
F26	Switching frequency	15KHz		
△F27	Motor timbre	0		
F36	30Ry action mode	0		
△F40	Torque limit 1 (electric)	200		
△F41	Torque limit 1 (brake)	200		
E01	X1 terminal function selection	0		
E02	X2 terminal function selection	1		
E03	X3 terminal function selection	2		
E05	X5 terminal function selection	7		
E09	X9 terminal function selection	9 (4)	Set to 4 if less than 7.5KW, set to 9 if more than 11KW	
E10	Acceleration time 2	3.5s	Medium speed acceleration time	
E11	Deceleration time 2	2.5s	Medium deceleration time	
E12	Acceleration time 3	3.5s	High acceleration time	
E13	Deceleration time 3	2.0s	High deceleration time	
E14	Acceleration time 4	11s	Stop deceleration time	
E20	Y1 terminal function selection	0		
E46	Language	1		
C05	Multi speed 1	2.5 Hz	Creeping speed	
C06	Multi speed 2	2.5 Hz	Inspection speed	
C07	Multi speed 3	1.5 Hz	Leveling speed	
C08	Multi speed 4	*	Low speed (V4)	Set the speed at different section according to various elevator speed in light of SJT-WVF5 elevator control
C09	Multi speed 5	*	Medium speed 1 (V3)	

C10	Multi speed 6	*	Medium speed 2 (V2)	system debugging and maintenance instruction.
C11	Multi speed 7	*	High speed (V1)	
C12	Multi speed 0	*		
C31	Analog input shift control	*	Field setting	

C33	Analog input filtering time	0.05	Enter filtering to analog port 12
P01	Motor poles	20	See motor nameplate
P02	Motor power	*	See motor nameplate
P03	Motor rated current	*	See motor nameplate
P04	Self-learning item	0	Self-learning is 3
P06	Motor no-load current	0	Not set
P07	%R1	5	
P08	%X	10	
P09	Motor rated slip	0	Not set
H11	Deceleration mode	1	
H18	Torque control selection	3	Enter with analog port 12 to conduct torque compensation
O01	Speed instruction mode selection	02	PG is UVW type
O02	Speed instruction filtering time constant	0.020	
O03	Encoder pulse count	8192	See the nameplate of encoder
O04	ASR P constant (high speed)	5	
O05	ASR I constant	0.3	
O06	Speed feedback filtering time constant	0.003	
O07	ASR P constant switching frequency 1	0	
Parameter	Description	Setting value	Note
O08	ASR P constant switching frequency 2	5	
O09	ASR P constant (low speed)	10	
O10	Multi speed uniform timing	0.005S	
O11	Emergency mode acceleration and deceleration time	1.0	
O13	S-curve setting 1	20	S-curve at acceleration start
O14	S-curve setting 2	20	S-curve at medium 1 (V3) and low (V4) acceleration end
O15	S-curve setting 3	20	S-curve at medium speed 1 (V3) and low (V4) deceleration start
O16	S-curve setting 4	20	S-curve at acceleration end
O17	S-curve setting 5	20	S-curve at medium declaration end
O18	S-curve setting 6	20	S-curve at high acceleration end
O19	S-curve setting 7	16	S-curve at high deceleration end

O20	S-curve setting 8	18	S-curve at deceleration end
O21	S-curve setting 9	30	
O22	S-curve setting 10	30	
O24	Torque offset start-up timing	0.2S	Actual field setting
O35	Torque offset increment (electric)	50%	Actual field setting
O36	Torque offset increment (brake)	50%	Actual field setting
O37	Torque instruction filtering time constant	0.0	
O38	Start-up speed	0.3	
O53	self-learning angle	0~360	

1. Self-learning angle description: set P04=3 and press DATA

2. Require the U, V, W of motor correspond to the U, V, W of the inverter

3. After self-learning for 5 times, observe the value of O53 to see that the error is not more than 20 degrees.

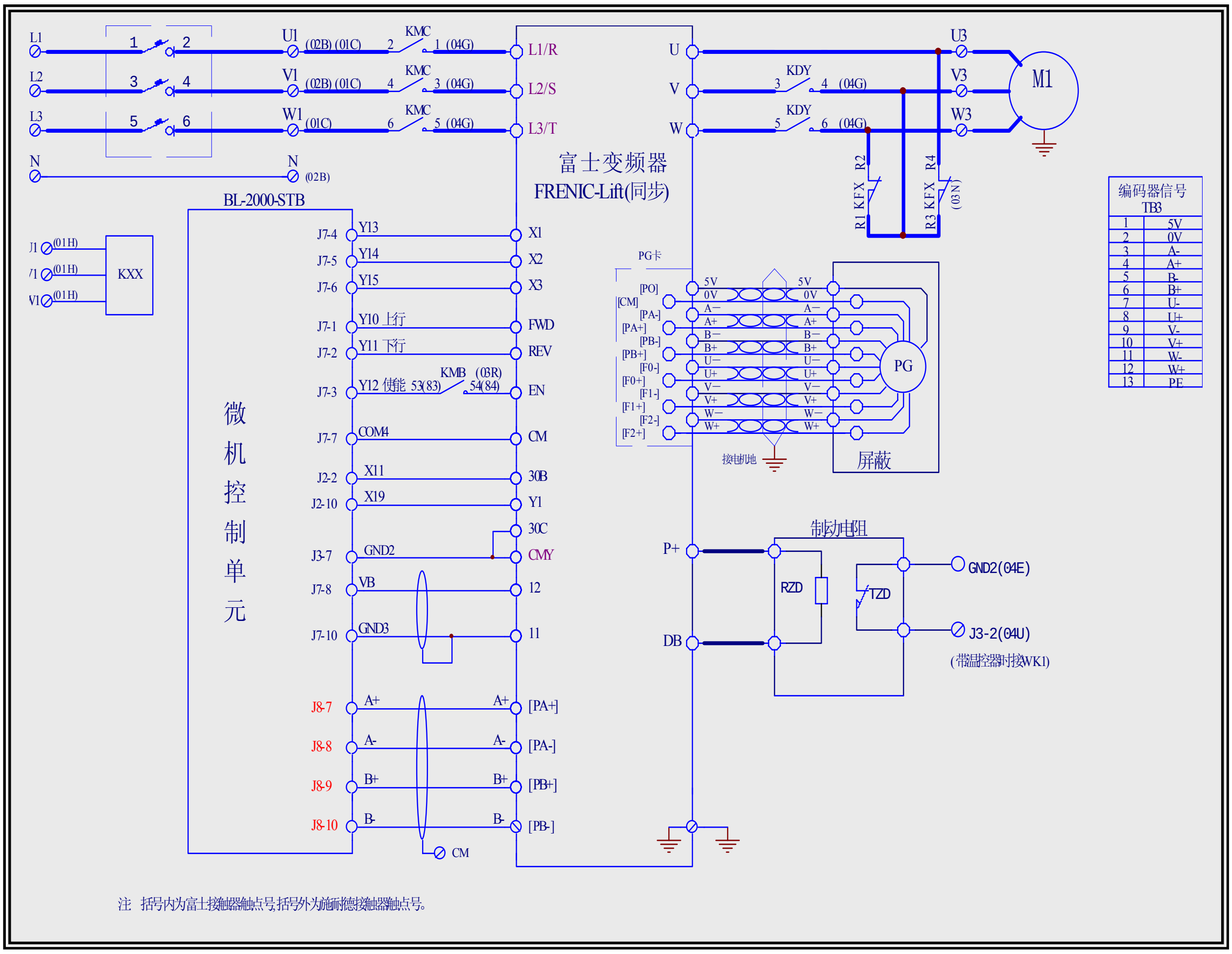
4. The current of test run is around 0.5A (without steel cable on the motor).

5. Power on repeatedly and when it goes normal after running for several times, make sure that self-learning is correct.

6. If there is OS, please check if the connection between the motor and inverter and between PG and inverter is correct.

5. Fuji FRENIC-LIFT Inverter Connection Diagram and Parameter Setting Table

(1) Inverter terminal connection diagram



富士变频器	Fuji inverter
同步	Synchronous
编码器信号	Encoder Signal
接电机地	Grounding motor
微机控制单元	Computer control unit
屏蔽	Shielded
制动电阻	Brake resistor
带温控器时接 WK1	Connect to WK1 in the case of with thermostat
注：括号内为富士接触器触点号，括号外为施耐德接触器触点号	Notes: the number inside the brackets denotes the contact of Fujitsu Contactor and that outside brackets denotes the contact of Schneider contractor.

(2) Set up the parameters of inverter according to the following table (reference only): multi-segment

Parameter	Description	Setting value	Note
F01	Speed setting	0	Multi speed instruction with S-curve acceleration and deceleration (SS1,SS2,SS4)
F03	Max speed	*	See motor nameplate
F04	Rated speed	*	See motor nameplate
F05	Rated voltage	380V	
F07	Acceleration and deceleration	3.5S	Low acceleration time

	time 1		
F08	Acceleration and deceleration time 2	2.1S	Low deceleration time
F23	Start-up speed	0.4Hz	
F24	Duration	0.3s	
F25	Stop time	0.1Hz	
F42	Control selection	0	Control with PG vector (asynchronous)
E01	X1 terminal function selection	0	
E02	X2 terminal function selection	1	
E03	X3 terminal function selection	2	
E10	Acceleration and deceleration time 3	3.5s	Medium speed acceleration time
E11	Acceleration and deceleration time 4	2.5s	Medium speed deceleration time
E12	Acceleration and deceleration time 5	3.5s	High acceleration time
E13	Acceleration and deceleration time 6	2.0s	High deceleration time
E14	Acceleration and deceleration time 7	11s	Creeping deceleration time
E18	Multi speed instruction uniform timer	2	
E19	Multi speed instruction uniform timer time	0.010	
E20	Y1 terminal function selection	35	Inverter outputting
E27	Terminal 30A/B/C (relay output)	99	Whole alarm
E48	LED monitor details	2	Set speed
E61	Terminal 12 (function selection)	4	Torque offset instruction
C05	Multi speed 1	8	Terminal landing creep speed, unit: HZ
C06	Multi speed 2	8	Inspection speed
C07	Multi speed 3	3	Creep speed
C10	Multi speed 6	30	Medium speed
C11	Multi speed 7	45	High speed
C31	Analog input shift control (terminal 12)	0	
C32	Analog input gain control (terminal 12)	100％	
C33	Analog input filter adjustment (terminal 12)	0.05s	
P01	Motor poles	*	See motor nameplate
P02	Motor capacity	*	See motor nameplate
P03	Motor rated current	*	See motor nameplate

P06	Motor no-load current	*	Set up according to default value
P12	Motor rated slip	Note	
L01	Pulse programmer (option)	0	Phase A and B: 12 or 15V complement, open collector and 5V line drive
L02	Pulse count	*	Set up according to actual configuration
L19	S-curve setting 1	20	S-curve at acceleration start
L22	S-curve setting 4	20	S-curve at medium acceleration end
L23	S-curve setting 5	20	S-curve at medium deceleration start
L24	S-curve setting 6	20	S-curve at high acceleration end
L25	S-curve setting 7	16	S-curve at high deceleration start
L26	S-curve setting 8	18	S-curve at deceleration end
L27	S-curve setting 9	30	
L28	S-CURVE SETTING 10	30	
L36	P constant at high speed	8	
L37	I constant at high speed	0.5s	
L38	P constant at low speed	10	
L39	I constant at low speed	0.5s	
L40	Switching speed 1	5HZ	
L41	Switching speed 2	10HZ	
L60	Torque shift gain on drive side	50％	Actual field setting
L61	Torque shift gain on brake side	50％	Actual field setting

Notes: Motor rated slip freq. = basic freq. $\times \dfrac{\text{Synch. speed} - \text{rated speed}}{\text{Synch. speed [r/min]}}$ [Hz]

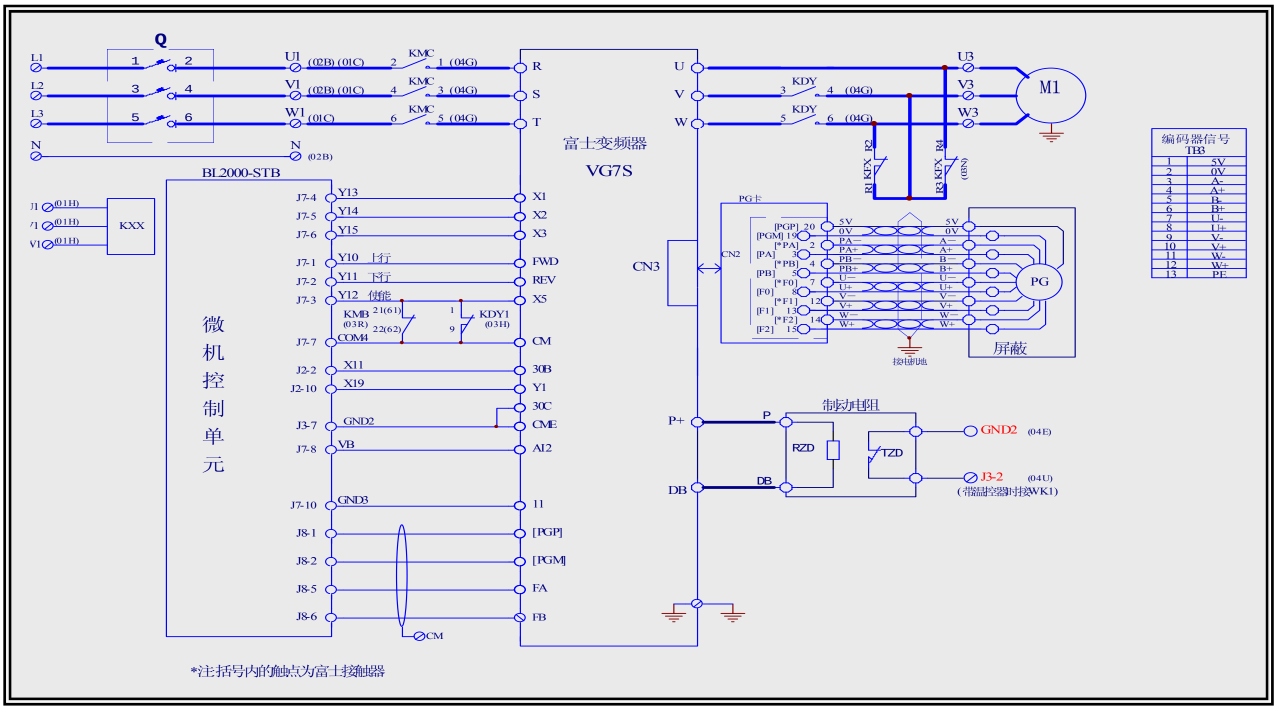
Implementation of self-tuning:

1. Please set 1 or 2 in function code P04, and press DATA key (blink of 1 or 2 display will slow down)
2. Enter the operation instruction of the determined rotation direction.
3. The display of 1 or 2 will be lightened and self-tuning starts. (self-tuning time: when P04=1, max time is around 15secs)
4. Upon the ending of test, it will display “end”.
5. Set the operation instruction to OFF, self-tuning finishes and the operation panel will display a function code (P06).

The after self-tuning motor constant will be saved automatically, that is, P07 for primary Resistance％R1, P08 for leakage reactance％X, P06 for no-load current and P12 for rated slip.

6. Fuji VG7S Inverter Connection Diagram and Parameter Setting Table

（1）**Inverter terminal connection diagram**



富士变频器	Fuji inverter
微机控制单元	Computer control unit
屏蔽	Shielded
编码器信号	Encoder Signal
制动电阻	Brake resistor
带温控器时接 WK1	Connect to WK1 in the case of with thermostat
注：括号内触点为富士接触器	Notes: the contact inside the brackets denotes the contact of Fujitsu Contactor

(2) Set the parameters of inverter according to the following table (reference only): multi segment

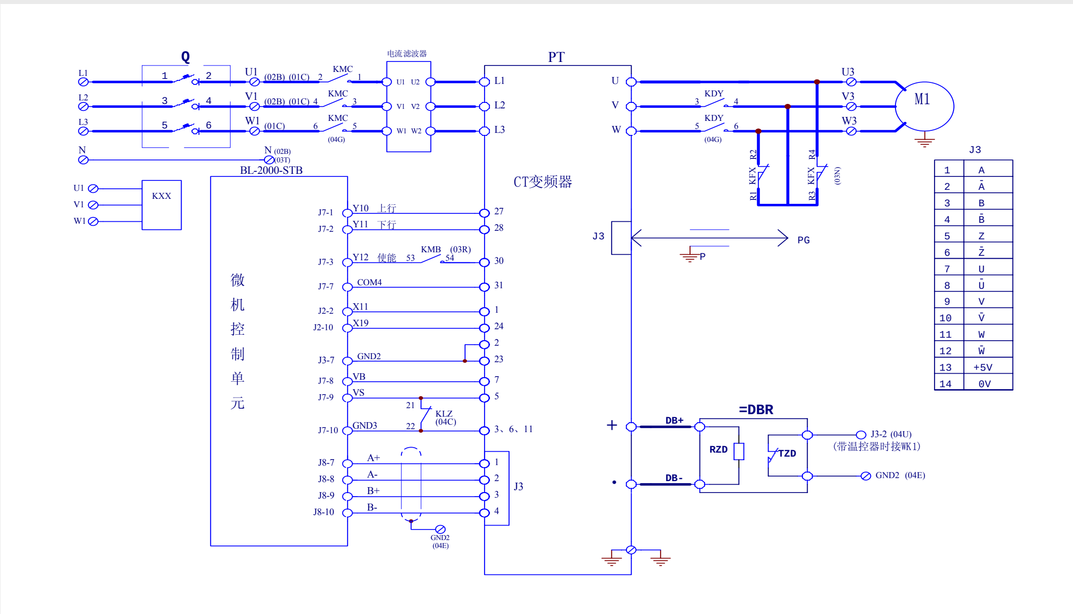
Func.No	Name	Standard value	Setting value
C05	Multi speed 1	0r/min	24
C06	Multi speed 2		0
C07	Multi speed 3	0r/min	10
C08	Multi speed 4	0r/min	0
C09	Multi speed 5	0r/min	96
C10	Multi speed 6	0r/min	153
C11	Multi speed 7	0r/min	192
C20	Multi speed instruction uniform timer	0.00	0.02
C35	acceleration time JOG	5.00S	3
C36	deceleration time JOG	5.00S	3
C46	acceleration time 2	5.00S	3
C47	deceleration time 2	5.00S	3
C56	acceleration time 3	5.00S	3.8

C57	deceleration time 3	5.00S	3
C67	deceleration time 4	5.00S	1
E01	X1 function selection	0	0
E02	X2 function selection	1	1
E03	X3 function selection	2	2
E04	X4 function selection	3	8
E05	X5 function selection	4	7
E15	Y1 function selection	1.00	0
E16	Y2 function selection	2.00	1
E17	Y3 function selection	3.00	4
E18	Y4 function selection	4.00	5
E29	PG pulse output selection	0.00	0
E38	Speed detection mode	0.00	0
E39	Speed detection value 1	1500r/min	24
E49	Ai1 function selection	0.00	5(+-10v)
E55	Ai1electric Gein	1.00	2.8
E56	Ail brake Gein	1.00	2
E61	Ai1 filter setting	0.010s	0.1
E69	AO1 function selection	1	26 u-v
E70	AO2 function selection	6	31(O10)
E84	AO1-5filter setting	0.010s	0.00
F01	Analog mode		2
F02	Running and operation	0	1
F03	M1 max speed	1500 r/min	192
F04	M1 rated speed	1500 r/min	192
F05	M1Rated voltage	Volume classV	380
F07	Acceleration time 1	5.00S	3.5
F08	Deceleration time 1	5.00S	3
F37	Stop speed	10.0r/min	0.1
F38	Stop speed (detection mode)	0	0
F39	Stop speed (zero-speed control duration)	0.50s	0.5
F61	ASR1-P (gain)	10	10
F62	ASR1-1 (integrator constant)	0.200s	0.3
F65	ASR1 detection filter	0.005s	0.002
F80	Motor selection (M1.M2.M3)	0	2 HT
H71	self_- learning ^+stop key	0	_5
L03	Lift rated speed	100.0m/min	120
L04	Fixed S-curve mode	0	0
L05	S-curve setting 1	0.00%	20
L06	S-curve setting 2	0.00%	20
L07	S-curve setting 3	0.00%	20
L08	S-curve setting 4	0.00%	20
L09	S-curve setting 5	0.00%	20

L10	S-curve setting　6	0.00%	20
L11	S-curve setting　7	0.00%	20
L12	S-curve setting　8	0.00%	20
L13	S-curve setting　9	0.00%	20
L14	S-curve setting　10	0.00%	20
O09	ABS signal input definition (synchronous)	0	1
O10	Magnetic pole position offset (synchronous)	0	*
O11	Salient pole ratio (%Xq/%Xd)		1
P01	M1 control mode	0	3
P02	M1 motor selection	Volume class	37
P03	M1 rated capacity	Volume class	13.4
P04	M1 rated current	Volume class	30
P05	M1 poles	4	20
P06	M1-%R1	Volume class	3.6
P07	M1-%X	Volume class	22
P08	M1 exciting current	Volume class	0.01
P09	M1 torque current	Volume class	30
P10	M1 slip at drive	Volume class	0.001
P11	M1 slip at brake	Volume class	0.001
P21	M1 induced voltage coefficient	Volume class	283
P28	M1-PG pulses	1024	8192
P30	M1 thermal resister selection	1	0

7. CT Inverter Connection Diagram and Parameter Setting Table

（1） Inverter terminal connection diagram



微机控制单元	Computer control unit
屏蔽	Shielded
编码器信号	Encoder Signal
制动电阻	Brake resistor
带温控器时接 WK1	Connect to WK1 in the case of with thermostat

（2） **Set parameter #0.00=1255 and initialized inverter parameter.**

（3） **Set parameter #0.00=1253 and control mode #0.48 to SErUO, i.e. closed loop servo control mode.**

（4） **Set the inverter parameter according to the following table (for reference only: analog**

Parameter	Description	Setting value	Remarks
#0.01	Min frequency	0	
#0.02	Max frequency (unit: rpm)	*	Rated speed of electrode
#0.03	Acceleration	0	
#0.04	Deceleration	0	
#0.05	Speed set mode selection	1	Analog set 1
#0.06	Current limit	175%	
#0.07	KP speed	6500	Adjust according to actual situation
#0.08	KI speed	600	Adjust according to actual situation
#0.10	Feedback speed of electrode	*	For monitoring
#0.11	Set before slope treatment	*	For monitoring
#0.12	Set after ramp treatment	*	For monitoring
#0.13	Active current of electrode	*	For monitoring
#0.15	Slope mode selection	1 (FAST)	
#0.16	Stop mode selection (6.01) sp	coast	
#0.18	S-curve enable (8.29=on) sp	0	
#0.42	Motor poles	*	See motor nameplate
#0.43	Motor COSΦ	1.0	
Parameter	**Description**	**Setting value**	**Remarks**
#0.44	Motor rated voltage	*	See motor nameplate
#0.45	Motor rated speed	*	See motor nameplate
#0.46	Motor rated current	*	See motor nameplate
#0.47	Motor rated frequency	*	
#1.10	Forward and reverse enable	1	
#2.02	Slope enable	0	
#3.05	Zero speed definition	0	
#3.08	OS threshold (0.26) sp	*	Rated speed of motor plus 20
#3.21	Encoder lines (0.27/0.34) sp	*	Set according to encoder lines
#3.23	Encoder voltage selection (3.36) sp	*	5V: set to 0; 15V: set to 1.
#4.08	Torque set	*	Set by load detection device

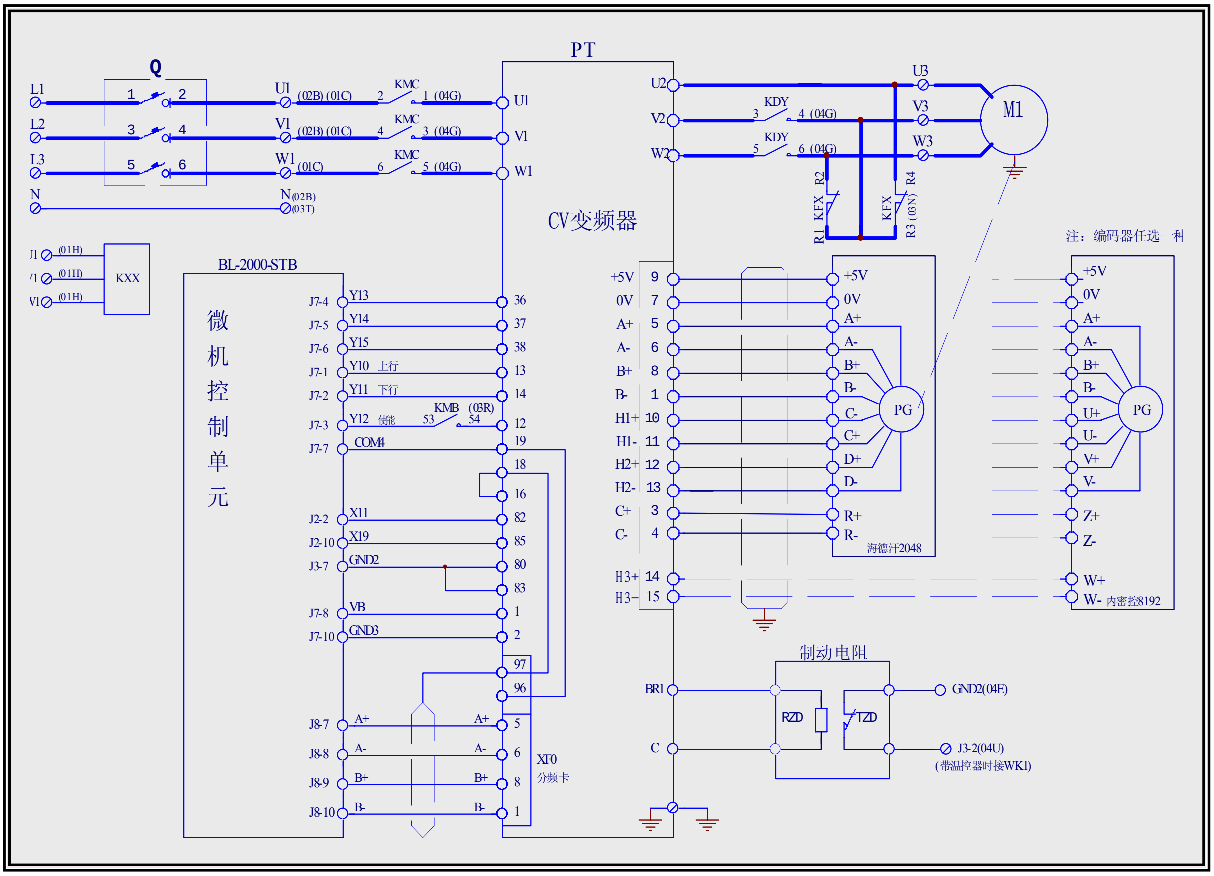
#4.09	Torque offset	*	Adjustment according to actual situation
#4.10	Torque offset enable	1	
#4.11	Torque mode selection	4	Note: set to 0 in the case of motor self-learning!
#4.15	Motor thermal time constant	89	
#6.15	Soft enable	1	
#7.06	Analog voltage input mode	VOLT	
#7.07	Analog input offset (7.30) sp	0	
#7.08	Analog input calibration	1	Adjust according to actual situation
#7.10	Analog mapped input	1.36	
#7.11	Analog voltage input mode	VOLT	
#7.12	Analog input calibration	1	
#7.14	Analog mapped input	4.08	
#7.15	Analog voltage input mode	VOLT	
#8.10	F1 output source parameter	10.02	
#8.11	F1 output phase reversal	0	
#8.12	F1 output enable	1	
#8.27	Logic input polarity selection	0	
#8.28	Open collector output selection	0	
#10.34	Auto reset times	5	
#10.35	Auto reset interval	0	

（5） **Motor PG origin self-learning method:**

After control cabinet is powered on normally and making sure the connection of encoder is correct, set the motor to no-load state and short-circuit the terminal J16-2 with terminal J16-1 on the main board (refer to page 4 of the Motor Schematic Diagram) and make contactor KDY pull-in. Refer to page 3 of Electric Schematic Diagram to short-circuit the proper terminals and make the brake (LZ) open, then short-circuit the control terminal 30 and 31 of inverter, set the parameter 0.40 to 1, then the motor will start slowly after confirming. When the 1 in the parameter 0.40 becomes to 0 automatically, self-learning finishes. Parameter stores in parameter 3.28. If self-learning suspends and the fault signal displays, please exchange any two phases of the motor after turning off the power and then restart the self-learning.

8. SIEI Inverter Connection Diagram and Parameter Setting Table (multi speed)

(1) **Inverter terminal connection diagram**



CV 变频器	CV inverter
注：编码器任选一种	Note: choose one encoder
微机控制单元	Computer control unit
制动电阻	Brake resistor

(2) The following parameters are only for your reference, please make adjustment according to actual situation:

Item	Terminal			Speed value
	38	37	36	
self-learning speed	0	0	1	300mm/s
Inspection speed	0	1	0	300mm/s
Creep speed	0	1	1	50 mm/s
Speed 4	1	0	0	0 mm/s
Speed 3	1	0	1	0mm/s
Speed 2	1	1	0	1000mm/s
Rated speed V_1	1	1	1	1600mm/s

（1） **Steps for Adjustment**

◆ After finishing connection, check for the correct connection of the main loop and control loop of inverter to avoid the damage of inverter. Check for the correct connection of encoder and the U V W of the outlet line of inverter to the U V W of the motor line.

◆ Set the control mode as synchronous elevator control mode and short-circuit the terminal 19 with terminal 12 of the inverter and make the output contactor and brake contactor pull in to conduct the current self-learning of hoist machine.

◆ After self-learning finishes, start the zero setting of encoder.

◆ After the above step finishes, set the parameters and start slow running.

◆ In the circumstance of slow running can go normally and elevator is operating normally, start the fast running of elevator to see if there is backward sliding and overshoot in the process of up run and down run. If backward sliding occurs, increase the function of pre-torque.

◆ When slow and fast running can both go normally, adjust the S-curve parameter and P, I parameters to adjust the comfort at high-speed running of the elevator.

（2） **General parameters of elevator**

◆ Motor data

Parameter	Setting value	Note
Rated voltage (Rated voltage)	380V	
Rated current	61.5A	*
Rated current	234rpm	*
Pole pairs	10	
stator resistance	0.8Ω	*
Stator inductance)	0.020H	*
Torque constant	18.210NM/A	*
EMF constant	10.514	*

◆ Self-learning

Please refer to the current self-learning step of gearless motor that follows.

◆ Encoder zero setting

Please refer to the gearless motor magnetic orientation step that follows.

◆ Mechanical data

Parameter	Setting value	Note
Travel unit reselection	Millimeters	
Gearbox ratio	2	
Pulley diameter	410mm	*
Full scale speed	150rpm	*

◆ Weights

Parameter	Setting value	Note
Cabin weight	2100kg	*
Counter weight	2900kg	*
Load weight	1600kg	*
Rope weight	300kg	*
Motor inertia	5.0	*
Gearbox inertia	0.0	*

◆ Encoders config

Parameter	Setting value	Note
Encoder type	0 (Std encoder)	
Std enc type	4 (Sinusoidalsincos)	
Std enc pulses	2048pps	
Std dig enc mode	0 (FP)	
Std enc supply	0 (5.14V)	

◆ BU protection

Parameter	Setting value	Note
BU control	1 (internal)	
BU resistance	15Ω	*
BU resistance	8.0KW	*

◆ Regulation mode

Parameter	Setting value	Note
Regulation	4 (Brushless)	

◆ Speed profile

Parameter	Setting value	Note
Smooth start spd	5mm/s	
Self-learning speed (Multi speed1)	300mm/s	
Inspection speed (Multi speed2)	300mm/s	
Creep speed (Multi speed3)	50 mm/s	
Speed 4 (Multi speed4)	0mm/s	
Speed 3 (Multi speed5)	0mm/s	
Speed 2 (Multi speed6)	1000mm/s	
Rated speed (Multi speed7)	1600mm/s	

◆ Ramp profile

Parameter	Setting value	Note
MR0 acc ini jerk	300 mm/s^3	
MR0 acceleration	600 mm/s^2	
MR0 acc end jerk	500 mm/s^3	
MR0 dec ini jerk	500 mm/s^3	
MR0 deceleration	600mm/s^2	
MR0 dec end jerk	500mm/s^3	
MR0 end decel	200mm/s^2	

◆ Lift sequence

Parameter	Setting value	Note
Cont close delay	304ms	
Brake open delay	416ms	
Smooth start dly	400ms	
Brake close dly	3000ms	
Cont open delay	200ms	

◆ Speed reg gains

Parameter	Setting value	Note
SpdP1 gain%	20%	
Spdl1 gain%	3.3%	
SpdP2 gain%	20%	

Spdl2 gain%	5%	
SpdP3 gain%	25%	
Spdl3 gain%	12%	
Sped 0 enable	2 (Enable as start)	
Sped 0 P gain%	19%	
Sped 0 I gain%	20%	
Prop filter		

- Speed threshold

Parameter	Setting value	Note
Spd 0 ref thr	1rpm	
Spd 0 ref delay	3000ms	
Spd 0 speed thr	1rpm	
Spd 0 spd delay	3000ms	
SGP tran21 h thr	94%	
SGP tran32 l thr	5%	
SGP tran21 band	4%	
SGP tran32 band	4%	

- Inertia compensate

Parameter	Setting value	Note
Inertia comp en	1 (Enable)	

- Speed regulator

Parameter	Setting value	Note
SpdP base value	50A/rpm	
SpdI base value	8000A/rpm	

◆

Parameter	Setting value	Note
TRAVEL\Ramp function	Default	
TRAVEL\Ramp setpoint	Default	
TRAVEL\ Speed setpoint	Default	

Note: set the parameters marked with * according to actual situation.

（3） **Steps for gearless motor current self-learning**

- Enter STARTUP/SETUP MODE/Autotune/Complete still;
- Open brake KDY when displaying Press I key, press the STAR key of inverter after giving enable and direction;
- Cancel enable and direction upon displaying END;
- Execute Load setup.

（4） **Steps for gearless motor magnetic orientation**

- Enter REGULATION PAPAM\Flux config\Magnetiz config\Autophasing menu;
- In the case of without steel cable, pull in KDY, enable, and make brake pull in, then press Enter;
- Give enable and direction when inverter displays “Waiting start……”;
- When inverter displays “Autophasing End”, cancel enable and direction, close KEY and brake；
- Execute Save config.

（5） **Gearless motor magnetic orientation operation**

- ◆ **Open brake by means of BL2000-STB and KDY, give enable and direction to conduct motor self-learning:**
  - ◇ Properly seal the door lock and emergency stop, change the input type of X19 in Inspection state；
  - ◇ Inverter enters self-learning to wait for KDY, brake, enable and direction state；
  - ◇ Change the input type of X1, BL2000-STB main board will output KDY, brake, enable and direction state;
- ◆ After self-learning finishes, it will restore the input type of X1 and then that of X19.

9. Parameter Setting Table for the Yaskawa Inverter for WVF5 Synchronous System

Steps for setting the parameters of inverter:

1. First, set the parameter of "Control Mold" to A1-02=6
2. Then use "Initialization" parameter A1-03=2220 to initialize the parameters of inverter.
3. Set the parameters of inverter according to the following table (reference only for multi segment), set o1-03=Motor poles, o1-04=1 will display rotation number.

Parameter	Description	Setting value	Remarks
A1-00	Digital operator display language selection	0	English (default)
A1-01	Parameter access level	2	ADVANDCED
A1-02	Control mode selection	6	PM vector with PG
B1-01	Frequency instruction selection	0	Digital operator
B1-02	Running instruction selection	1	Control loop terminal (sequential control)
B1-03	Stop selection	1	Free running stop
B1-06	Control terminal two-time read time selection	0	2ms
C1-01	Acceleration time 1	2	Set in Second Acceleration time from 0% to 100% of max output frequency
C1-02	Deceleration time 1	2	Set in Second Deceleration time from 100% to 0% of output frequency
C1-08	Deceleration time 4	3～5	Deceleration time at the frequency below C1-11
C1-11	Acceleration and deceleration time switching frequency	*	Consistent with d1-04 setting
C2-01	S-curve characteristic time at acceleration start	0.7	
C2-02	S-curve characteristic time at acceleration end	0.7	
C2-03	S-curve characteristic time at deceleration start	0.7	
C2-04	S-curve characteristic time deceleration end	0.7	
C5-01	ASR proportional gain 1	10	
C5-02	ASR integration time1	0.35	
C6-11	Carrier frequency selection	4	
d1-02	Frequency instruction 2	0	Self-learning speed (Set up according to actual need)

d1-03	Frequency instruction 3	15	Inspection running speed (Set up according to actual need)
d1-04	Frequency instruction 4	6	Creep speed (Set up according to actual need)
d1-05	Frequency instruction 5	*	Low speed (V1) (Set up according to actual need)
d1-06	Frequency instruction 6	*	Medium speed 1 (V2) (Set up according to actual need)
d1-07	Frequency instruction 7	*	Medium speed 2 (V3) (Set up according to actual need)
d1-08	Frequency instruction 8	*	High speed (V4) (Set up according to actual need)
E1-01	Inverter input voltage	380	Unit: V
E1-04	Max output frequency/rotation number	*	Sam as E1-06
E1-05	Max voltage	*	See motor nameplate
E1-06	Basic frequency/rotation number	*	See motor nameplate
E1-09	Min output frequency/rotation number	0	
E5-02	Motor rated capacity	*	See motor nameplate, take note of unit
E5-03	Motor rated current	*	See motor nameplate, take note of unit

Parameter	Description	Setting value	Remarks
E5-04	Motor poles	*	See motor nameplate
E5-05	Motor armature resistance	*	Set up according to the results of motor self-learning
E5-06	Motor d axis inductance	*	Set up according to the results of motor self-learning
E5-07	Motor q axis inductance	*	Set up according to the results of motor self-learning
E5-09	Motor induced voltage parameter	*	Set up according to the results of motor self-learning
E5-11	PG origin pulse compensation	*	Set up according to the results of motor self-learning
F1-01	PG parameter	*	Set up according to the encoder actually installed
F1-02	PG wire break detection action selection	1	
F1-03	Action selection in the case of overspeed	0	Ramp to stop according to C1-02 time
F1-04	Action selection in the case of DEV	0	Ramp to stop according to C1-02 time
F1-08	Overspeed detection value	105	
F1-09	Overspeed detection time	1.0	
F1-10	DEV detection value	30	
F1-11	DEV detection time	1.0	

H1-01	Terminal S3 function selection	24	Multifunctional contact input 1
H1-02	Terminal S4 function selection	14	Multifunctional contact input 2
H1-03	Terminal S5 function selection	3	Multifunctional contact input 3
H1-04	Terminal S6 function selection	4	Multifunctional contact input 4
H1-05	Terminal S7 function selection	5	Multifunctional contact input 5
H2-01	Terminal M1-M2 function selection	37	
H3-15	Terminal A1 function selection	1	Torque compensation
H3-16	Terminal A1input gain	120%	Set up according to actual field setting
H3-17	Terminal A1input offset	0	
L3-04	Antistall function selection in deceleration	0	
L8-07	Output side lack-phase protection selection	1	
o1-01	Drive mode display item selection	5	Select the monitored item number that needs to be displayed in drive mode
o1-02	Monitored display item selection when power is ON	1	Set up monitoring frequency instruction,
o1-03	Frequency instruction setup/display unit selection	*	Set up according to motor poles
o1-04	Frequency instruction parameters setup unit	1	Display rotation
S1-20	Zero-servo gain	*	Set up according to field setting
S1-24	Up-run torque compensation offset	-60%	Set up according to actual field setting
S1-25	Down-run torque compensation offset	-60%	Set up according to actual field setting

*The methods to adjust the start-up torque compensation are as follows:

1. **Parameter H3-15=1, simulation input terminal A1 0～10V.**
2. **Parameter H3-17=0**
3. **Adjust parameter S1-24 and S1-25 (adjust to negative direction) until no sliding at both up run and down run.**
    i. **Note: S1-24 and S1-25 use the same value (if set to -60%)**
4. **H3-16=2×(S1-24), if set to 120%.**

10. L7B synchronous motor self-learning method and magnetic pole detection method when self-learning

Compared with 646GL5-IP, the self-learning method of L7B is more simple and visualized and can learn out the motor parameters that couldn’t be learned out before. Its self-learning method is the same as the rotating self-learning method of G7.

Steps for PM motor self-learning

1. Short-circuit the terminal BB and BB1 on terminal L7B with terminal SC separately.
   Terminal BB and BB1 are both the hardware base locking signals of L7B and can’t be shielded through changing parameter; and the base locking signals can only be cancelled by short and if they are not cancelled, PM self-learning can’t be conducted.
2. Connection of motor PG.
   Please use PG-X2 card as the speed feedback card of PM motor and choose long line 819P/R encoder with phase A, B and Z as output for the PM motor. Select the encoder with e=T±T/2 to realize the required precision of encoder. Please not if the PG voltage class is 12V or 5V.

3. Setting of control mode

A1-02=6 with PG PM motor vector control mode

4. Parameters setting for self-learning.

a. Enter AUTOTURNING menu

b.T1-01=0 full self-learning. In the case that motor parameters are set correctly, conduct phase A origin self-learning T1-01=4 only. The rest T parameters don't need to be set.

c. Set motor parameters

T2-01= motor power (KW)

T2-02= motor basic rotating speed (RPM)

T2-03= motor rated voltage (V)

T2-04= rated current (A)

T2-05= motor poles

T2-06= motor d axis inductance

T2-08= motor induced voltage parameters

T2-09= PG pulse per pole rotation (PPR)

d. Press RUN key to start self-learning (the whole self-learning process lasts about 2 mins)

Note: The initial values of E5-06 and E5-07 of L7B may be greater than the actual values of the motor, please reduce the two values before self-learning, thus to reduce the vibration at self-learning. But please ensure E5-06<E5-07.

5. Correct the Ld and Lq values after self-learning.

Check for the consistence between the values of E5-06 (motor Ld and d axis inductance) and E5-07 (motor Lq and q axis inductance). When the motor is SPM (surface mounted permanent magnet) , the value of E5-06 can be equal to the value of E5-07, then it is needed to set E5-07=1.2×E5-06。

6. Test-running motor.

Run the motor at the speed of 10%, 20%, 50% and 100% of full speed to observe if there is abnormal vibration or noise and monitor the value of U1-03 is normal, if there is any fluctuation or severe fluctuation. Cut off the power (display on operator disappears), then power on and run it to observe if it can start up smoothly (this is primary magnetic pole detection function test). Repeat the above operations for several times and observe. Please refer to Magnetic Pole Estimation and Detection Method for more overall primary magnetic pole detection test.

Test of primary magnetic pole detection accuracy at PM motor self-learning

This is for testing the how L7B coordinates with PM motor. Usually, after doing this and succeed on one motor, there is no need to do so on other motors of the same type and same power.

1. Please refer to self-learning method 1-4 for the self-learning of PM motor
2. Record the value of E5-11
3. Cut off the power (no display on operator)
4. Power on
5. Turn the motor shaft by hand for at least 3 turns
6. Turn the motor shaft by hand and adjust the value of U1-78 (magnetic pole position detection value (sensor)) and make it the value of the angle to be tested (starting phase of primary magnetic pole)
7. Cut off the power (no display on operator)
8. Power on
9. Reset the parameters within E2 and E5 parameter set to the factory defaults (initialization can't rest the E2 and E5 parameter set to the factory defaults, so it has to be input by hand).
10. Repeat step 1-9 and record the parameters of E2 and E5 parameter set after each self-learning.

Note: if self-learning fails, repeat step 3-9 after input according to the previous succeeded E5-11.
The angle that need to be tested include: 0, 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180, 195, 210, 225, 240, 255, 270, 285, 300, 315, 330 and 345, among which, 0, 90, 180 and 270 are tested for five times each and the others three times.

Appendix 3　Reference list of fault codes

1. List of system fault codes

Fault code	Description	Treatment
Er2	Door interlock fault: door interlock circuit is opened in the running of elevator	Check the interlock circuit and if the cam is scratching the sheave.
Er3	Inverter fault	Check the fault code of the inverter and confirm the reason.
Er4	Elevator direction is opposite to the instructed direction: a. the pulses of A and B phases of main board are reverse; b. elevator runs in reverse direction.	(1) Exchange the pulses of A and B phases of the main board; (2) Change the phase sequence of the motor.
Er5	Break on fault: after the system outputs the braking on instruction, it receives the feedback signal of the braking inspection switch.	i.Check braking inspection switch and connections. ii. If there isn't switch, set the braking feedback inspection enable to be No.
Er6	Landing input signal doesn't open in running	Check the signal circuit and inducing switch.
Er7	The number of encoder pulses inspected by the main board in running is too small.	Check pulse input circuit of main board and connection of encoder
Er9	KDY fault: the input KDY action instruments are not in accordance with the feedback result.	Check KDY output and feedback circuit as well as the KDY contactor.
Er10	emergency stop circuit are opened	Check the emergency stop circuit.
Er11	Landing missing: the running distance of elevator exceeds the distance between two floors, but the elevator doesn't inspect the landing input signal	Check the landing signal circuit and the inducing switch.
Er12	Exceed the upper limit	Check the encoder or the relative circuits.
Er13	Exceed the lower limit	Check the encoder or the relative circuits.
Er14	Floor counter error: after the fault, the elevator will run to the bottom floor and correct the position	（1）Check the encoder or the relative circuit; （2）Check the landing circuit; （3）The typical faults: the beginning of the landing is tingled or any rope slides.
Er17	after the main board outputs the instruction, it doesn't receive the inverter running signal	(1) Check inverter direction; enable signal, and running signal output circuit. (2) Check the relative parameters setting of the inverter.
Er18	Floor number counting error: after the fault, the elevator will run to the bottom floor and correct the position	Check the encoder or the relative circuit;
Er19	The distance to target floor is not enough and speed can not be changed normally; hoistway self-learning can not completed after the terminal landing installing position changed.	1、Decrease the running speed for single floor, reduce the speed changeover distance; 2、Complete the hoistway self-learning
Er20	When the elevator runs to the top floor and changes speed, the running speed decreases; hoistway slef-learning can not completed after the terminal landing	1、Increase the proportional parameter of inverter; check the matching of the braking resistance 2、Slow down the running curve;

	installing position changed.	3、 complete hoistway learning;
Er21	Running time over setting time	(1) check the relative inverter parameters setting (2) check whether steel wire slides or car is blocked; (3) Check the setting value of item Over Time.
Er22	Inspection signal input at high running	Check the inspection switch and the relative circuit.
Er23	One of two landing input signals is invalid	Check the signal and the inducing switch.
Er24	When given in multi-speed mode, speed change distance is too short.	Set the reasonable speed changeover distance according to the running speed
Er25	Thermal switch protection, brake resistor or motor overheating	Check the thermal switch circuit.
Er26	Door interlock fault, the condition of contact of interlock contactor is inconsistent with that of the winding	Check the conditions and the main board as well as the corresponding input terminal
Er27	Emergency stop fault; the states of contact of the emergency stop contactor and coil are not the same	Check the conditions and the main board as well as the corresponding input terminal
Er28	The upper and lower terminals or the second top and the second bottom terminals are adhered	The relative terminal landing is not valid at the installing floor, check the terminal landing signal
Er29	Over large communication interference protection (system or parallel communication)	1. inspect grounding of the system to solve the interference; 2. Check the damage of the calling board or the operating board which can damage the CAN communication bus.

2. List of hoistway learning fault codes

Fault No.	Description	Referenced treatment
LER=0	System running protection	Strike 'esc', check fault record. Find the treatment according to the appendix 3.
LER=1	Reverse pulse input	Adjust the phase sequence of pulse input. Exchange A phase and B phase.
LER=2	Bottom terminal 1 input repeat	Bottom terminal 1 is installed incorrectly; therefore some terminal signal inputs or Bottom terminal 1 is tingled. Check the installation of bottom terminal 1.
LER=3	Bottom terminal 1 lost (>2.0m/s)	Bottom terminal 2 arrives before bottom terminal 1 or bottom terminal 1 lost; Check the installation of bottom terminal 1.
LER=4	Bottom terminal 2 input repeat (>2.0m/s)	Bottom terminal 2 is installed incorrectly; therefore some terminal signal inputs or Bottom terminal 2 is tingled. Check the installation of bottom terminal 2.
LER=5	Bottom terminal 2 lost (>2.0m/s)	Top terminal 2 arrives before bottom terminal 2 or bottom terminal 2 lost; Check the installation of bottom terminal 2.
LER=6	Top terminal 2 input repeat (>2.0 m/s)	Top terminal 2 is installed incorrectly; therefore some terminal signal inputs or top terminal 2 is tingled. Check the installation of top terminal 2.
LER=7		
LER=8	Top terminal 2 lost (>2.0 m/s)	Top terminal 1 arrives before top terminal 2 or top terminal 2 lost; Check the installation of top terminal 2.
LER=9	Bottom terminal 1 lost	Top terminal 1 arrives before bottom terminal 1 or bottom terminal 1 lost; Check the installation of top terminal 1.
LER=10	Top terminal 1 input repeat	Top terminal 1 is installed incorrectly; therefore some terminal signal inputs or top terminal 1 is tingled. Check the installation of top terminal 1.

LER=11	Top terminal 1 lost	Top limit is arrived before top terminal 1 or top terminal 1 lost; Check the installation of top terminal 1.
LER=12	Learn No. of total floors error	Check whether the total floor setting is in accordance with the actual floor; check whether the sight guard of the landing is lacked or whether the landing switch is sheltered by the baffle plate.
LER=14	Two landing switches without overlap	The sight guard can not shelter the two landing switches (check the installation of the landing switch) or one switch is lost.
LER=15	Strike ‘esc’ to cancel learning	Pressing **Esc** key to cancel learning during the learning process.
LER=17	Landing 1 and 2 input at the same time	The conducting wires of the two landing switch are installed incorrectly to be parallel, or bottom limit is nearby the leveling position of one floor.
LER=18	Save data in error after learning	▲contact with our company
LER=19	two landing signals input together, top limit switch too low	move up the top limit switch
LER=20	Bottom limit too high	move down the bottom limit switch
LER=21	bottom terminal or bottom terminal 2 still valid when learning to the top limit	Check the installation of the bottom terminal or the bottom terminal 2 or check the type of switches
LER=22	Top terminal or top terminal 2 valid when learning from bottom limit	Check the installation of the top terminal or the top terminal 2 or check the type of switches.
LER=23	No pulse input during learning	1、 check the connection of the main board pulse input; 2、 if it occurs on the top landing during the multi-segment running, it is because speed is not set for the inverter during the creeping segment(when the learning runs to the landing of the top floor, the running speed changes from the inspection speed to the creeping speed).

▲ **Note:** for the elevator above 2.0m/s or if FU25 is set to be ON, the system will additionally provide the top and bottom terminal 2 switches.

Appendix 4　Operating Instructions of SJT-YY Lift Emergency Automatic Leveling Control Device

1. Overview

SJT-YY lift emergency automatic leveling device is applicable to emergency operation when power supply is abnormal. When the elevator stops between floors, by utilizing the internal accumulator, this control device would supply power to run the car to the nearest floor, and then level, open the door and evacuate the trapped passengers.

This control device achieves the power failure emergency automatic leveling by the coordination of the internal control circuit, inverter and microprocessor. Compared with the traditional similar product, this control device makes the maximum utilization of the existing resources of the elevator control system. It has the characteristics of low cost, high reliability, flexible control, etc.

2. Scope of Application

This device is applicable to variable frequency speed control elevator drived by gearless permanent magnet synchronous motor drive or asynchronous motor.

3. Model/Specification

Model/specification instruction of the device

SJT-YY□ □ □

A: Power of asynchronous motor≤19KW or
Power of synchronous motor≤12KW

B: Power of asynchronous motor≤30KW or
Power of synchronous motor≤22KW

G: Asynchronous motor Model

T: Synchronous motor Model

Blank: Standard Model

I, II: Improved Model

4. Working Principle and Functions

When the device is working, the internal control circuit supplies power and control signal to the inverter and microprocessor. The combined action of the internal control unit, frequency inverter and microprocessor controls the elevator to level at the nearest floor in low speed and open the door. The specific functions are as follows:

(1) The device and the elevator control system use reliable electric interlock system. When the power supply restores, the elevator will return to the normal running.

(2) Only when all the following conditions have been met, will this device run:

① Elevator power failure
② Elevator is in the non-inspection state.
③ Elevator is not in landing.
④ The elevator Safety circuit signal and door interlock circuit signal are normal.

(3) In the above operating conditions, if only condition ③ is not met and all other conditions meet the requirements, the device will open the elevator door automatically.

(4) When the elevator is in emergency operation, it can choose the running direction automatically.

(5) Elevator leveling is accurate, the precision is ±15mm.

(6) The device has maximum operation time protection function.

(7) The device has automatic constant voltage and constant current charge function.

5. Installation and Adjustment

Fitting wiring diagram of the device and the SJT-WVF5 elevator control system produced by our company is shown in Fig.1. For fitting wiring diagram of the elevator control system produced by other company, this figure can also be provided as a reference. Or our company can provide alternative design for them.

(1) Port Function Definitions of the Device are as Follows:

Symbol	Description	Location	Instruction
PS1 PS2	Input power	CN1-1 CN1-12	PS1 and PS2 are the input power. They must be from one of the three phases and the neutral of main power supply. AC220V±15% 50HZ, They provide charge power to the device. And they are used to determine whether the power supply is normal. Wires of $2mm^2$ are recommended.
Y5	Power failure output signal	CN1-6	Separate the grounding terminal of brake voltage DC192V supplied by the accumulator from the grounding of brake circuit (only for synchronization system).
BS+ BS-	Output power	TB1-1 TB1-2	BS+ and BS-, DC192V, are the output power of the device for power supply to the inverter. $4mm^2$ wire is recommended.
BK+ BK-	Output power	CN1-3 CN1-14	BK+、BK- are the brake power output provided for the device.. DC 192V is for the model with synchronous motor, and the model with asynchronous motor is DC110V. $0.75mm^2$ wire is recommended.

CP1 CP2	Output power	CN1-4 CN1-15	CP1 and CP2 are the output control power provided for the device. AC220V 50HZ, maximum power 600W. They are used to supply power to the control circuit and door machine circuit. 0.75mm^2 wire is recommended.
IL1 IL2	Power interlock input	CN1-7 CN1-17	IL1 and IL2 are the interlock input normally closed points of the device provided by the control system. They are used for the electric interlock of the device and elevator control system.
IL3 IL4	Power interlock output	CN1-5 CN1-16	IL3 and IL4 are the power interlock output normally closed points provided by the control system. They are used for the electric interlock of the device and elevator control system.
IL5 IL6	Power interlock output signal	CN1-8 CN1-18	They are used for interlocking with power and electric control of the control system.
Y4 COM4	Power failure output signal	CN1-19 CN1-9	They are used to lock the normally open point of the phase-sequence relay in safety circuit when the power fails.
Y3 COM3	Power failure output signal	CN1-20 CN1-10	They are used to provide input signal for the microprocessor.
Y2 Y6 COM2	Power failure output signal	CN1-21 CN1-13 CN1-11	They are used to provide input signal for the inverter. COM2 is the common terminal. Y2 provides running signal of the frequency inverter accumulator. Y6 provides inverter fault reset signal.

(2) Installation, wiring and debugging

① Disconnect the air switch F1, F2, F3, F4 (such a switch is provided when YASKAWA 676GL-JJ and Varispeed-L7B inverter systems are used) and rocker switch F2 (F1, F2, F3 and F4 are device's shutdown switch. They are in disconnect state when they leave the factory)

② Cut off elevator power supply.

③ Connect the separate terminals of the random cable to the control system according to wire number in compliance with the instruction and requirement of the wiring chart and the above figure. Use the supplied cable to connect the power at the side of inverter with the BS+ and BS- of the device. When YASKAWA 676GL5-JJ and Varispeed-L7B inverter are used, use supplied cable to connect P0 and N0 of the control cabinet with P0 and N0 of the device.

④ Strictly check if all the wirings are correct. Incorrect wiring may damage the device or the control system's power-on.

⑤ When all the wirings are checked to be correct, insert the cable plug-in into CN1. Turn off the air switch F1, F3, F4 and rocker switch F2, press power switch of UPS to power the elevator on.

⑥ If the elevator functions normally, set the relevant parameters of inverter.

⑦ Run the elevator to a certain floor, cut off the power. At this moment, the door should open automatically.

⑧ Power on the elevator again. Park the elevator between floors and cut off the electricity again. When emergency operating conditions are met, the elevator should run towards the light load direction, level and open the door.

6. Fault Analysis and Troubleshooting

1. The elevator power is abnormal after the device is connected. Check the interlock wiring.

2. When the power is cut off, there is no display on inverter. Check whether air switch F3 and F4 are shut. Check whether the output power BS+ and BS- are greater than DC192V, whether air switch F1 is shut, and whether battery wiring is secured and reliable .

3. When the power is cut off, the device is connected and the elevator is powered on, the frequency converter has no display. Check if air switch F1 is shut.

4. When the power is cut off, the microprocessor has no display. Check if rocker switch F2 is closed and if the UPS power switch is shut (it should always in the ON state).

5. In emergency operation, the brake of the elevator isn't on. For synchronous motor, check if the brake power output is DC192V. For asynchronous motor model, check if the brake output signal is normal.

6. When power fails, emergency operation does not work. Check if the emergency stop and gate lock circuits are normal, if the elevator is in the non-inspection state, if the normally open point of phase-sequence relay is normal and if the input signals of microprocessor and frequency converted are normal.

7. Technical Parameters

1. Input power AC220V$\underline{+}$15％ 50HZ ±10%

2. Output power DC192V
AC220V 50HZ I_{ced}≤3A
DC110V (for asynchronous motor model) I_{ed}≤3A

3. Ambient temperature: 0℃～40℃

4. Relative humidity:20～90％ non condensing

5. Leveling precision: $\underline{+}$15mm

6 Applicable Motor power: Model an asynchronous motor≤19KW synchronous motor≤12KW
Model B asynchronous motor≤30KW synchronous motor≤22KW

7. Maximum run time ≤2 min

8. Cabinet dimension:
YB：840*240*450
YC：574*180*721

8. Service and Maintenance

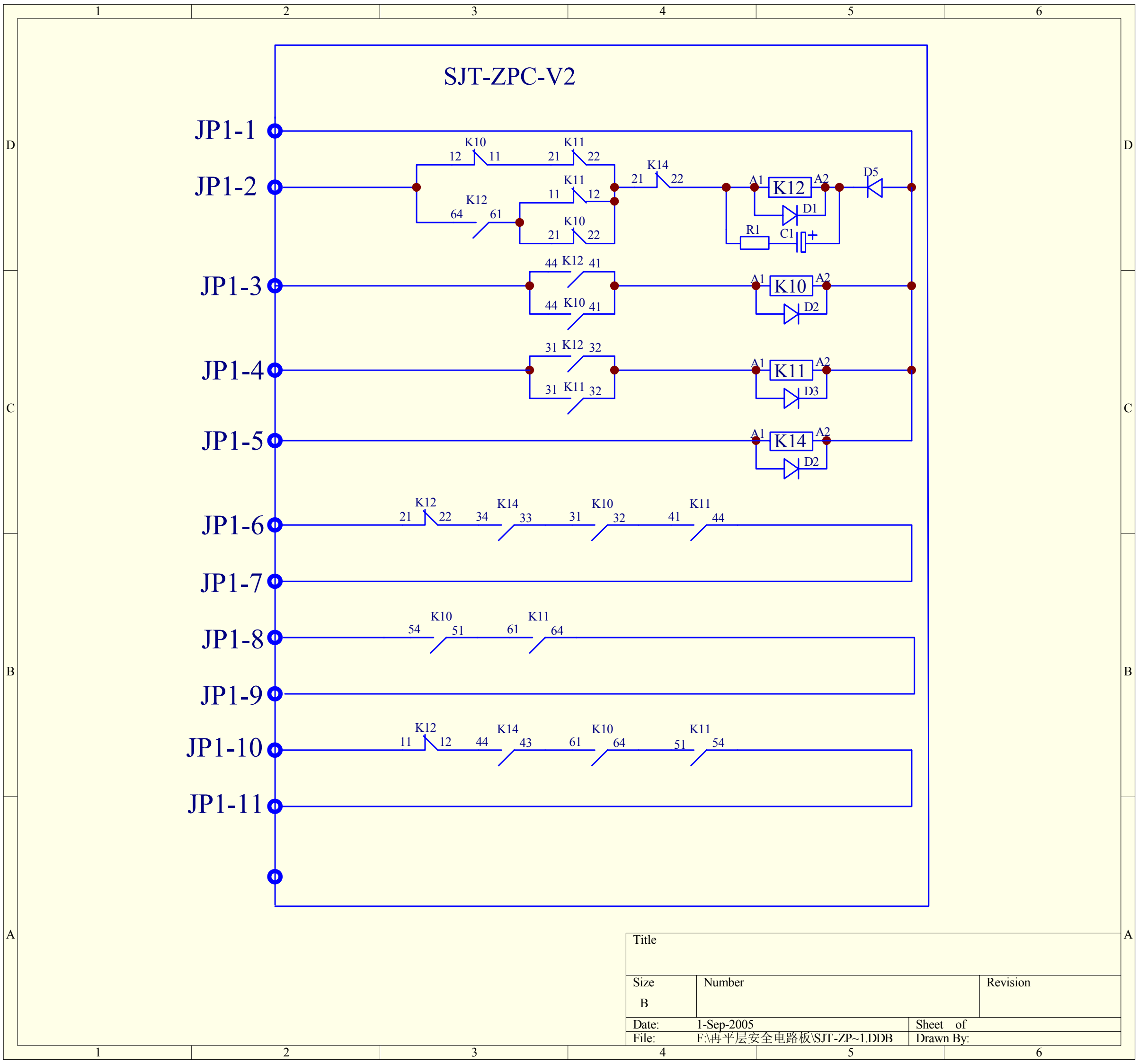
1. Accumulator should be used in clean, dry and well-ventilated environment. Short circuit is strictly forbidden. Contact with organic solution and open fire is prohibited. During transportation of the device, keep top side up and avoid collision and violent vibration. Grounding of the accumulator terminal should be kept in good condition.
2. Periodical (e.g. a quarter) check on the accumulator's voltage (those of F1-1 and BS- should be greater than DC192V) and one trial run are recommended.

3. When the accumulator in emergency system reaches the end of service life (when it reaches 50% of the early stage discharge time), the service time shortens significantly, and it would result in the accumulator faults such as the internal short circuit, electrolyte drying up (internal resistance increase) or the corrosion of positive grid. If the accumulator is still in use in this state, the maximum charge current will continue to flow. Heat losses and leakage might happen in the accumulator. Replace the accumulator before it reaches the above state.

Accumulator surface temperature	Recommended replacement time
Below 25℃	Within 6 years
30℃	Within 4 years
40℃	Within 2 years

Appendix 5 Advance Door Opening/Re-Leveling Instruction

1. Safety Circuit Board (SJT-ZPC-V2) Schematic Diagram

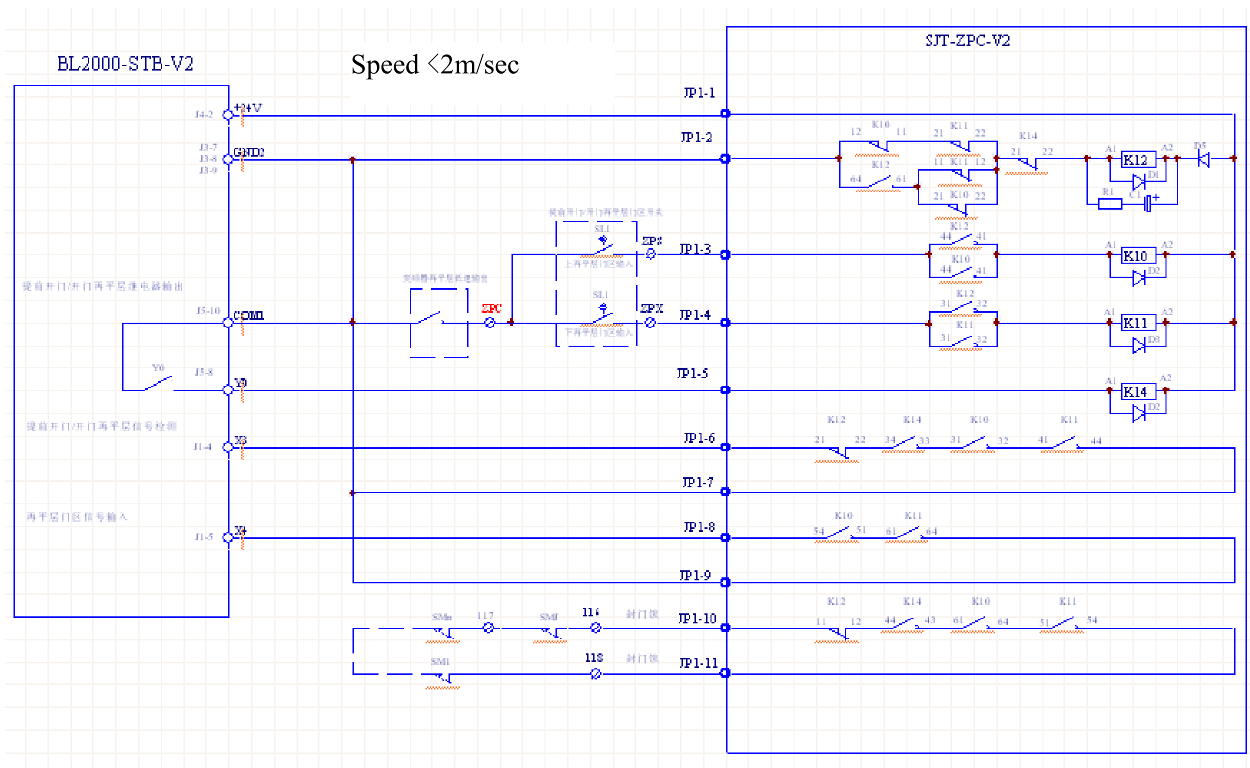


2. Safety Circuit Board Definition

Name	Location	Definition	Name	Location	Definition
JP1	JP1-1	24V+	JP1	JP1-7	Re-leveling condition satisfied output common port
	JP1-2	0V		JP1-8	Re-leveling landing output
	JP1-3	Re-leveling upper landing		JP1-9	Re-leveling landing output common port

	JP1-4	Re-leveling lower landing		JP1-10	Door lock output
	JP1-5	Control system re-leveling condition satisfied		JP1-11	Door lock output
	JP1-6	Re-leveling condition satisfied output			

3. Wiring Diagram When BL2000-STB-V2 Main board is used in Advance Door Opening/Re-Leveling Function (Elevator speed is less than 2 m/sec.)



上再平层门区输入 upper releveling landing input　　封门锁： Sealing lock

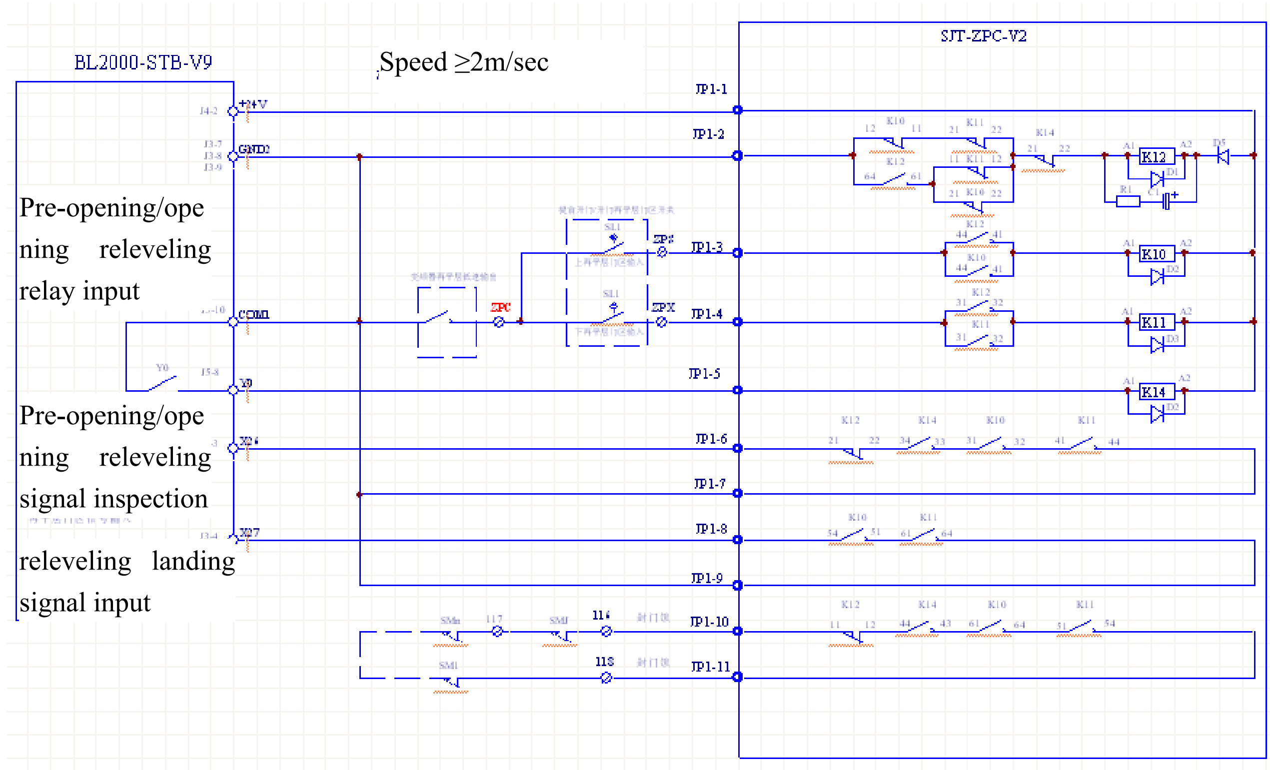
下再平层门区输入 lower releveling landing input

提前开门/开门再平层继电器输出： Pre-opening/opening releveling relay output

提前开门/开门再平层信号检测： Pre-opening/opening releveling signal inspection

再平层门区输入：releveling landing signal input

4. Wiring Diagram When BL2000-STB-V9 is used in Advanced Door Opening/Re-leveling Function

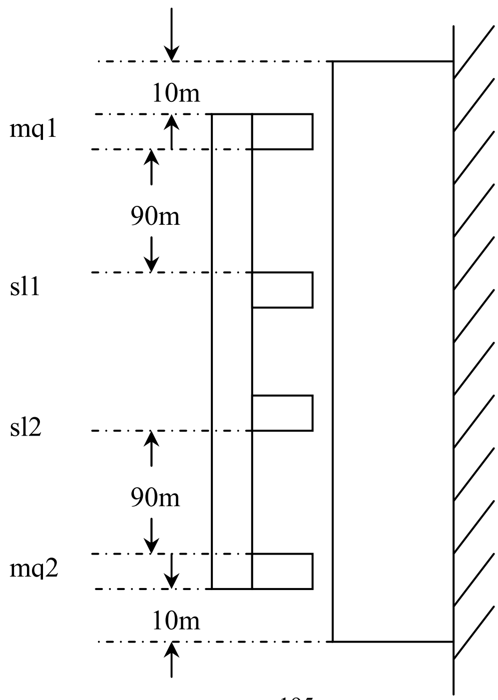


上再平层门区输入 upper releveling landing input　　封门锁： Sealing lock

下再平层门区输入 lower releveling landing input

5. Installation Instructions of Re-Leveling Landing Sensor and Landing Sensor

Two landing sensors have to be installed when advance door opening /re-leveling function is used: mq1: upper landing; mq2: lower landing; sll: upper re-leveling landing; sl2: lower re-leveling landing. Landings should be installed in order, or, the running direction of the re-leveling is in reverse direction.



6. Mainboard Parameter Setting

6.1 Advanced door opening/ re-leveling function enable by special function selection setting in special parameters

Special function selection setting

Function NO.	Function instruction
FU00~FU18	For the definition, see system instruction manual
*FU19	ON：door opening re-levelling enable；OFF：no re-levelling function
*FU20	ON：advance door opening enable；OFF：no advanced door opening function

6.2 advance door opening/re-leveling function running parameter in running parameters

Three advance door opening and re-leveling related parameters are added in running parameter:

Open door speed
0.15m/s

Open door speed

Relevelst speed
0.20m/s

Leveling stop speed

Relevelrun speed
0.20m/s

Leveling running speed

Open door speed: Elevator advance door opening speed when the elevator switches speed to go into the re-leveling landing.

ATTENTION: When running in multi speeds (use double door zero speed FU02=ON), the creep speed after speed switch must be less than this speed.

Leveling stop speed: If the speed in advance door opening or re-leveling process is more than this speed, the elevator stops running.

Leveling running speed: the set re-leveling running speed when the analog is given.

6.3 Advance door opening/re-leveling function speed table in multi-speed running

ATTENTION: When running in multi speeds, double door zero speed FU02=ON must be used to reduce the creeping speed after speed switch.

Multi speed command output logic

Item \ Port	Y15 (J7-6)	Y14 (J7-5)	Y13 (J7-4)
Inspection running speed/self learning speed	0	1	0
Re-leveling running speed	0	0	1
Creep speed	0	1	1
Low speed (V1)	1	0	0
Medium speed1 (V2)	1	0	1
Medium speed2 (V3)	1	1	0
High speed (V4)	1	1	1

7. Hall door and car door separate inspection function

Use high voltage inputs X24 (J5-3) and X25 (J5-4) to inspect hall door circuit relay contact; use X14 (J2-5) to inspect car door circuit relay contact and modify the drawings of circuit relay contacts needing serial or parallel connections. Then hall door and car door separate inspection function can be achieved (For detailed drawings, please contact with Technology Department of our company).