Operation **Manual**

EC100 Elevator Intelligent Integrated Machine

Preface

EC100 elevator intelligent integrated machine is the new intelligent elevator control system with drive technology, control technology and network communication technology. Applying advanced frequency vector control technology, intelligent elevator control technology, network communication technology, our products integrate drive, control and management of the elevator to improve the safety and reliability, operation, economy and individual design.

Main features:

 - Integrated design, simple wiring and easy debugging
 - The highest floor: 64th floor   Max. speed: 6m/s
 - Distance control principle
 - Automatic identification running of low floor station
 - Advanced starting compensation of non-load sensor
 - Synchronous and asynchronous master; Static and dynamic self-tuning function
 - Vector control
 - Encoder interface of synchronous and asynchronous master
 - CAN serial communication
 - Automatic car position correction
 - Single-phase AC220V low voltage aid function
 - LED displaying and operation, compatible manual controller and PC debugging software
 - Multiple safety protection; meet the standards of EN81 and GB7588
 - EMC meet C3 standards
 - Various safety design
 - Intelligent, network-based control group control, as much as 8

If the product is ultimately used for military affairs or weapon manufacture, it will be listed on the export control formulated by *Foreign Trade Law of the People's Republic of China*. Rigorous review and necessary export formalities are needed when exported.

Content

Chapter 1   EC100 configuration

1.1 Hardware configuration

No	Product name	Product model	Application	Parameter	Installation position	Remarks
1	EC100 elevator intelligent integrated machine	To the actual use	Motor drive control and elevator logic control	1 for each elevator	Elevator control cabinet	Equipped, select according to the power
2	Manual controller	EC100-PAD	For controller debugging		EC100 elevator intelligent integrated machine	Optional
3	EC100-I/Oi nterface board	EC100-I/O	For input/output interface shifting	1 for each elevator	Control cabinet of the elevator	Equipped, 1 connection cable with DB62 core
4	Main car controller	DC-01	For the signal collection in the car and door control	1 for each elevator, the highest 32-floor	Control box	Equipped, with 12 floor internal commands, dual door control
4	Car top board	EC-CTB	For the signal collection in the car and door control	1 for each elevator, the highest 64-floor	Top of the car	Equipped, with 12 floor internal commands, dual door control
5	Car instruction extension board	DC-02	For calling button extension above 12th floor	1 for each 8-elevator above the 12th floor	Control box	Equipped with car top, or DC01 in the condition of above the 12th floor
5	Instruction extension	EC-CCB	For calling button	Extend 16 floors for	Control box	Equipped with car top, or DC01 in the condition of above the 12th floor

			extension at the car top	the 1st, 20 floors for additional 1		
	board of car top					
6	Displaying board in the car	DC-03A	For displaying in the car	1 for each elevator	Control box	Standard
7	Calling displaying board	DC-03A	For calling and displaying	1 for each calling	Calling box	Standard
8	Ethernet module	PA_DP/E	Ethernet monitoring	1 for each elevator	EC100 complete machine	Optional
9	Group control board	MC-GCL	For group control communica-tion	1 for each elevator	Control cabinet of the elevator	Optional

1.2 Software standards

No	Type	Function name	Function instruction	Remarks
1	System	Floor-signal distance control	According to the distance control principle, get a running curve	Standard
2		Part programmable output	Logic control over relative relays of I/O board and car output through upper PC software integrated parameters of main board	Standard
3		Internal pre-weight compensation	External weight compensation device is not needed when applying speed loop and position loop	Standard
4		Autotuning of the master	Static and dynamic autotuning	Standard
5		Hoistway height autotuning	Hoistway autotuning before first running, including the height of each floor and the forced deceleration	Standard

No	Type	Function name	Function instruction	Remarks
			switch position.	
6		Full selective	The system will response the command signal in the car as well as the calling button signal.	Standard
7		Parallel operation	Connect two CAN communication wires realize parallel operation	Function selection
8		Real-time clock management	Real-time clock chip, work for 3 years without power	Standard
9		Manual operator	Chinese/English menu, functions of parameters setting and upload/download, fault diagnosis and state monitoring	Optional
10		Floor-signal distance control	According to distance control principle, get a running curve	Standard
11	Protection	OC protection	Protect and stop when overcurrent	Standard
12		OV protection	Protect and stop when overvoltage	Standard
13		OL protection	Protect and stop when overload	Standard
14		OL protection	The elevator will keep opening when the elevator is overload in the non-inspection state and it bees to alarm.	Standard
15		Overspeed Protection	Ensure the running speed is in the safe range.	Standard
16		Bus voltage protection	Protect and stop when bus undervoltage	Standard
17		Phase loss protection	Protect and stop when phase loss	Standard
18		To-ground	Inspect U, V and W when power on.	Standard

No	Type	Function name	Function instruction	Remarks
		short-circuit detection		
19		Inverter overtemperature protection	Protect and stop when inverter overtemperature	Standard
20		Rectifier overtemperature protection	Protect and stop when rectifier overtemperature	Standard
21		Motor overheating protection	If the thermal protection signal acts, the elevator will stop and open at the nearest leveling position. The elevator will begin to work after the time set by the protection parameter.	Standard
22		Non-opening protection	The system forbids automatic opening in non-door area.	Standard
23		Adhesion protection of the door switch	Protect and stop when the door switched is detected to adhesive.	Standard
24		Door beam protection	In the process of closing, if the door is blocked, it will open the door. Note: the function RSE will be automatically canceled in fire operation and the SE is effective (RSE for the front door beam of the single door operator).	Standard
25		Split-level protection	The elevator returns to the ground floor and correct when split-level	Standard
26		Encoder feedback detection protection	The system judge the current height and speed through high-speed counter. In running state, the system	Standard

No	Type	Function name	Function instruction	Remarks
			will stop the elevator if without encoder feedback.	
27		Reverse run protection	The system identify the direction through high speed counting. The system will stop if the running direction is different from the command direction.	Standard
28		Entire running time protection	If the elevator runs for the entire time without leveling command, the system will stop the running in the car.	Standard
29		Feedback detection of the braking travel switch	Detect the switch and protect automatically (36 dual braking detection defined by F0_12~14)	Standard
30		Contact detection of the running contactor	Detect the switch and protect automatically	Standard
31		Contact detection of the braking contactor	Detect the switch and protect automatically	Standard
32		Contact detection of the door lock contactor	Detect the circuit and protect automatically	Optional
33		Contact detection of safety contactor	Detect the circuit and protect automatically	Optional
34		Door lock off protection	The system will protect automatically when door lock is detected to off, and output close signal.	Standard

No	Type	Function name	Function instruction	Remarks
35		Lock short circuit protection	Detect the door lock when the door is open and protect automatically	Standard
36	Running mode	Inspection running	Operational function	Standard
37		Inspection speed limit	The speed switches to the inspection low speed when the elevator runs at inspection speed to the forced deceleration switch position.	Standard
38		Attendant operations	Operate on the attendant switch in the control box. The door will not close automatically in this mode until the attendant presses the close button for a long time. The buzzer alarms and the internal command flashes when outside calling.	Standard
39		Attendant direction switching	Change the direction by the UP/DOWN buttons or DS switch in the control box.	Standard
40		Attendant+XPM	If A1-00=2, the door will close when holding close button and open after releasing the button.	Function selection
41		Attendant+Bypass	In the attendant state, the elevator will not response any calling if it is full load.	Standard
42		Full load bypass	In the automatic running state, the elevator will not response any calling if it is full load. But the calling can be recorded; the outside calling can open the door. If the button acts, the calling cannot be recorded. The door can be closed by pressing close	Standard

No	Type	Function name	Function instruction	Remarks
			button and attendant is directional.	
43		Light load Anti-disturbance function	In LL switch action, if the commands in the car beyond 3, the system will clear all commands after running once.	Function selection
44		Independent running	The system will enter into the specific running mode by switching on the independent running switch.	Function selection
45		Calling VIP running	When enabling lock elevator signal of calling board, the elevator will shield calling inside and outside, go straight to the floor triggering calling VIP running, and keep opening. When the elevator responds to one inside calling after closed manually, it will exit calling VIP running.	Function selection
46		Self leveling run	If the elevator is in non-inspection state and not stop in the leveling area, the elevator will return to the leveling and open the door.	Standard
47		UPS running	2 optional running modes: 220V UPS power switching by F0_22 (need to detect UPS output feedback and bus fall and set KPWR logic point into normally closed); UPS automatic switching. Determine the running direction according to the load. Power-off input signal is present in the controller, and when the power is off, start UPS function automatically to open the door after low speed	Function selection

No	Type	Function name	Function instruction	Remarks
			leveling.	
48		Automatically return to the home floor	In non-attendant running mode , automatic returning signal is valid. If there is no command, the elevator will return to the home floor after the delay time. The elevator can enter standby by F0_18.	Function selection
49		Lock elevator	In running state, the lock switch acts to clear all outside calling record. The elevator runs normally and returns to the home floor after response all commands in the car. After that, the elevator stops and turn off the light and fan. The elevator reruns after lock switch is reset.	Standard
50		Fire evacuation operation	In running state, the fire switch acts to clear all calling records and run to the home floor at the fastest speed. After that, output fire signal to keep the door open. If the elevator is running reversal, leveling stop as near as possible and drive to the home floor and keep the door open.	Standard
51		Fire service	2 modes of fire service after the elevator returns to the home floor: a. fire fighter action by switching the switch in the control box; b. enter into the fire fighter action after the waiting delay time. there are no automatic opening and closing action in the fire fighter action.	Function selection

No	Type	Function name	Function instruction	Remarks
			Various modes can be selected and the door will be closed by the close button for fire.	
52		Seismic operations	When the input signal acts, the elevator will stop and open at the nearest leveling position.	Function selection
53		Test running	The function is used in debugging or a fatigue test of a new elevator. Operate the elevator in close mode by F0_16 and shield outside calling.	Function selection
54		Arrival gong	Ring when the elevator is arriving to the door area.	Function
55		Light and fan off when stand-by	The light and fan will be off when the door is closed and no internal command and outside calling signal.	Function selection
56	Door operator	Open/close door inspection	If the door lock circuit is off, press up/down button to get the closing command. When the circuit is on, the elevator will run up/down. If the elevator stops at the door area, press the up/down button at the same time to get the opening command and the elevator will open the door.	Standard
57		Repeated open/close the door	If the door of the elevator is not closed after closing for 20 seconds, the elevator will open the door. After repeating for 5 times, it will keep closing. If the door closes but the lock fails after closing for 10 seconds,	Standard

No	Type	Function name	Function instruction	Remarks
			the elevator will open the door. After repeating for 5 times, it will keep opening.	
58		Automatic control in opening hours	In non-attendant mode, the elevator will open the door automatically when arrived. The opening time can be delayed by setting parameters.	Function selection
59		Opening delay button	The elevator will keep opening for the set time of opening delay after pressing the button while it will close by pressing the close button.	Function selection
60		Hall opening	When the car stops at some floor, the door will open when pressing the opening button.	Standard
61		Internal command opening	Press the button to open the door if the elevator is in the leveling position.	Function selection
62		Pre-close of the closing button	Press closing button in the automatic state to close the door in advance.	Standard
63		Closed maintenance function	Set closing maintenance according to the types of door operator.	Function selection
64		Service floor setting	Set the stopping floor and closing/ opening state.	Function selection
65		Front/rear door service	Service floor setting through parameters	Function selection
66		Vice control box operation	With the same button and function with the main control box.	Function selection
67		Hand door control	To avoid short circuit of the lock, disconnect the lock once before fast	Function selection

No	Type	Function name	Function instruction	Remarks
			running.	
68	Other	LED display	2 digit, display floors and fault codes	Standard
69		Floor displaying	Dot matrix displaying	Standard DC-03A
70		Running direction displaying	Rolling displaying shows the running direction.	Standard DC-03A
71		Floor displaying setting	Set the characters of floor displaying through parameters.	Function selection
72		Fault history clearance	The system will record the latest 30 faults, including the fault time, fault code, floor information.	Standard
73		Error in internal command cancel	Pressing the button twice can cancel the internal command.	Standard
74		Reverse automatic number clearance	Select whether to clear the previous reverse commands by F0_18 when the elevator is arrived to the terminal floor or the running direction is changed.	Function selection
75		Failure diagnosis of hoistway autotuning	The elevator can not run without correct hoistway data.	Standard
76		Automatic car height correction	The system will correct the position data at the terminal door area and leveling switch position according to the autotuning data.	Standard
77		Leveling precision adjustment	Adjust the leveling precision.	Standard
78		Current ramp clearance	In the application of permanent magnet synchronous motor, the	Standard

No	Type	Function name	Function instruction	Remarks
			maintenance current is cleared through ramp to avoid abnormal noise.	
79		Strong braking contactor	The braking contactor and strong braking contactor output at the same time. After the set delay, the strong braking contactor is disconnected.	Function selection
80		Independent star-delta control	Set F0_12~14 to 37, KM2 and KM1 output together and the delay will be cancelled after disconnecting KM1 at stop.	Function selection

1.3 Software configuration

No	Function name	Function instruction	Remarks
1	Releveling after door opening	The system will level at low speed when the passengers enter or get off the elevator.	Configure EC-RDB
2	Arrival light outside the hall	The corresponding arrival light outputs when the elevator leveling or calling direction to inform the arrival and running direction. The up light flickers at the interval of 0.5s while the down light flickers at the interval of 1s until the lock is on or the direction is cancelled.	Configure outside forecast light and relay board
3	Arrival gang outside the hall	Arrival gang is installed in each floor. It rings when the elevator is in the door area. In the up/down arrival, it rings once and twice to inform the arrival and running direction.	Configure arrival gang outside the hall
4	Voice announcement	The current floor number and running direction will be announced when the elevator is in the door area.	Optional voice board
5	General/Special IC card in the car for floor service control	There is a card reader on the control box if configuring the function. The user can only record the authorized entering command by swiping the card in the car.	Optional IC card
6	Calling service	There is a card reader on the calling box if	Optional IC

No	Function name	Function instruction	Remarks
	control of car IC outside the hall	configuring the function. The user can only record the calling command with a card.	card
7	Single door operator and single control box	Default configuration	Configure single control box
8	Single door operator and dual control box	Use one EC-CTB and two EC-CCB, the buttons and lights of two control boxes have the same connection. Or use one DC-01 and one DC-02 (unnecessary below 12-floor), the buttons and lights are in parallel connection.	Configure dual control box
9	Dual door operator and single control box	In conditions that there is only front or rear door, and the doors both open or close simultaneously. (Select dual control box when either front door or rear door controls independently.)	Configure single control box
10	Dual door operator and dual control box	Use one EC-CTB and two EC-CCB, or use two DC-01 and two DC-02 (unnecessary below 12-floor). Front door opens in response to front door calling or for the open button or inside command of main control box when landing. Rear door opens in response to rear door calling or for the open button or inside command of sub control box when landing.	Configure dual control box
11	Remote monitoring	Remote monitor the floor position, running direction and fault state.	Configure DM20
12	GPRS remote alarm	After setting and connecting DM-03, elevator fault will be informed to the monitoring center and the short message will be sent to the maintainer.	Configure DM-03
13	Ethernet real-time monitoring	Monitor real-time (sample at the fastest 0.5ms) through PA_DP/E	Configure PA_DP/E
14	Group control running	As many as 8 elevators	Configure MC-GCL

Chapter 2   Precautions and notices

This manual describes how to use the product correctly. Read this manual carefully before using (installation, wiring, running, maintenance and inspection). Please use the product after mastering the safety precautions.

2.1 Safety marks

Safety marks are used in this manual and the content with marks are very important, please follow them.

⚡	Potential danger. Ignoring them may cause physical injury or death.
⚠	Potential danger. Ignoring them may cause physical injury or hurt or damage to the devices.
Note	Steps for correct running.

In some situations, the content in "NOTE" is very important .

2.2 Reader group

Elevator controlling engineer

Maintenance personnel

Technical support engineer

Note	◆ The diagrams in this manual are just examples and may be different from the products you ordered. ◆ For the convenient application, the content of this manual will update and change as the improvement and updating of the product. ◆ Please contact with our company as the way on the covers if needed. ◆ The content of this manual is confirmed correct when printing, but our company reserves the right of updating.

2.3 Warning marks

⚡	◆ Please maintain the machine after the power supply is disconnected for at least 10 minutes.

The marks are presented on the front cover of the inverter.

Follow the instructions of this manual when using EC100 elevator intelligent integrated machine.

2.4 Safety precautions
2.4.1 Unpacking inspection

⚠	◆ Do not install or work on any damaged components and parts, otherwise injury may occur.

Upon unpacking, confirm the following:

1． No damage occurred during transportation. (the damage or scratch to the machine).

2． The rated values on the inverter nameplate are in accordance with your order.

3． The optional parts are in accordance with your order. If you find anything wrong, please contact us or the distributor.

2.4.2 Disassembly and assembly

⚡	◆ Please install according to the mechanical and electrical installation standards. ◆ Only experienced professionals can do the installation. ◆ Read the manual and safety precautions before operation.
⚠	◆ Do move the machine by lifting its base, otherwise it may fall and get damaged. ◆ Mount the device on nonflammable material and keep away from any explosives and inflammable items, or fire and explosion may occur. ◆ The installation position should be free of dripping water or other liquids. Or damage may occur. ◆ The installation platform should be strong enough to sustain the controller, or the device dropping, physical injury and damage to the controller may occur. ◆ Please install fans or other cooling devices to ensure the temperature in the cabinet is below 45℃ when installing cooling fan or braking resistor in a cabinet. ◆ Make sure no conductive objects or other metal bars can fall into the controller, or fire and damage to the controller may occur.

2.4.3 Connection precautions

⚡	◆ Ensure the power supply is disconnected before connection, otherwise electric shock and fire may occur. ◆ Only professional electricians are allowed to do the connection, otherwise electric shock and fire may occur.

	◆ Ground the PE terminal with proper techniques, otherwise electric shock and fire may occur. ◆ Ensure the action is right after safe connection, otherwise physical injury may occur. ◆ Do not touch the conductor parts of the terminal directly or connect the output wires with the crust, otherwise the electric shock, short-circuit or fire may occur. ◆ Do not touch the board circuit with hands directly; otherwise the damage may occur to the components and parts.
⚠	◆ Ensure the voltage of AV main circuit is in accordance with the rated voltage of the intelligent integral machine, otherwise the electric shock, damage to the controller and fire may occur. ◆ Do not carry out any voltage-withstand test on the controller, otherwise damage may occur to the semi-conductors. ◆ Connect the braking resistor according to the wiring diagram, otherwise fire may occur. ◆ Tighten the screws according to the designated moment, otherwise fire may occur. ◆ Only professional technicians are allowed to do the design, installation, debugging and operation on the device. ◆ Follow the designated warnings, otherwise serious physical injury or death and property may occur. ◆ The input power lines should be tightened permanently and the device needs to be grounded with proper techniques. ◆ Dangerous voltage is still present on the following terminals if the intelligent integral machine does not work. ◆ Power supply terminal　R, S and T ◆ The connecting terminal U, V and W ◆ Wait at least 10 minutes after disconnecting the power supply until the CHARGE light is off and the machine is discharged.

2.4.4 Precautions of running

⚡	◆ Switch on the power supply after confirming the installation of terminal covers and do not remove the cover in

	connection, otherwise electric shock may occur.
	◆ Reset the fault after confirming the signal is disconnected, otherwise physical injury may occur.
	◆ Do not perform any signal inspection and wrong operation in running, otherwise physical injury or damage to the machine may occur.
⚠	◆ Cooling fin will become hot. Do not touch.
	◆ Do not touch the braking resistor, otherwise physical hurt and electric shock may occur.
	◆ EC100 elevator intelligent integral machine is set well in factory. Do not refit by yourself, especially in running, otherwise the damage to the machine may occur.

2.4.5 Precautions of maintenance and inspection

⚡	◆ There is high voltage terminal in the machine. Do not touch the terminal, otherwise electric shock may occur.
	◆ Do install the protective cover before powering on. Disconnect the breaker of the power circuit before removing the cover, otherwise electric shock may occur.
	◆ Do not remove the protective cover or touch the terminal before disconnecting the main circuit power. Carry out maintenance or inspection when confirm that the bus is discharged, otherwise the voltage is present in the capacitor and electric shock may occur.
	◆ Only qualified electrician is allowed to maintain, check and replace the components and parts, otherwise electric shock and damage may occur to the machine.
	◆ Please take off the metal accessories (such as watched and rings) in working and wear insolating clothes and use the insulating tools, otherwise electric shock may occur.
	◆ Do not change or remove the terminals or connector when power on, otherwise electric shock may occur.
⚠	◆ Please operate with cautions on the controlling board because there is integrate circuit.
	◆ The PCB boards may be damaged because of the static electricity if touch the boards by hands directly.

2.4.6 Other precautions

	◆ Do not refit the EC100 elevator intelligent integral machine by you, or electric shock, physical injury and damage to the machine may occur.

Chapter 3   Product overview

This chapter introduces the model, specification and performance of EC100 elevator intelligent integrated machine, as well as the delivery and installation.

3.1 Model description

EC100- ☐☐☐ -4

Voltage degree(4: 400V 2: 220V)

Power degree (015: 15kW)

Product type

3.2 Name plate

Company name ——
Model ——
Power ——
Input ——
Output ——

Bar code ——

Model: EC100-2R2-S2
Power: 2.2kW
Input: AC 1PH 220V±15% 23A 47Hz-63Hz
Output: AC 3PH 0V-220V 11A 0Hz-400Hz

S/N: Made in China

INVT Discovery Technology(WUxi) Co.,Ltd.
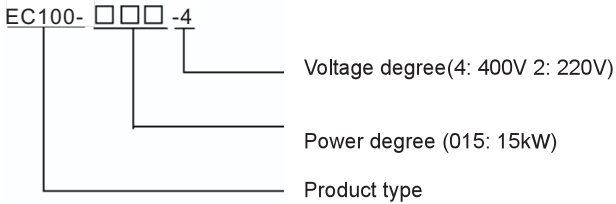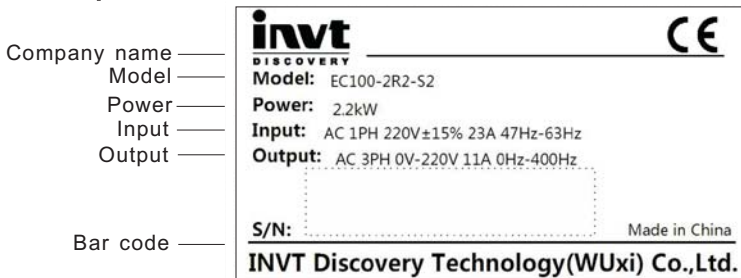
3.3 Power selection

Model	Rated output power（kW）	Rated output current（A）	Braking unit	Braking resistor
EC100-1R5-S2	1.5	5.5	Built-in	120Ω/400W
EC100-2R2-S2	2.2	11	Built-in	100Ω/1000W
EC100-004-4	4.0	11	Built-in	75Ω/1200W
EC100-5R5-4	5.5	13	Built-in	55Ω/1500W
EC100-7R5-4	7.5	18.5	Built-in	50Ω/2000W
EC100-011-4	11.0	27.0	Built-in	40Ω/4000W
EC100-015-4	15.0	34.0	Built-in	32Ω/4500W
EC100-018-4	18.5	38.0	Built-in	28Ω/5000W
EC100-022-4	22.0	46.0	Built-in	22Ω/7000W
EC100-030-4	30.0	62.0	Built-in	20Ω/10000W
EC100-037-4	37.0	75.0	DBU100H-060-4	14Ω/11100W
EC100-045-4	45.0	92.0	DBU100H-110-4	11Ω/13500W
EC100-055-4	55.0	115.0	DBU100H-110-4	9Ω/16500W

Note: EC100-1R5-S2 and EC100-2R2-S2 are single phase 220V input suitable for villa elevators.

	◆ The other power degree products are non-standard products. Please contact with our company directly if need.

3.4 Technical specifications

Item	Name	Specification
Input/output	Input voltage	400V±15%
	Input frequency	47~63Hz
	Output voltage	0~Rated input voltage
	Output frequency	0~400Hz
Elevator	Highest floor	64th
	Max. running speed	6m/s
	Group control quantity	8
	Communication mode	CAN communication
Peripheral interface	Digital low voltage input port	29 terminals, DC 24V/4.5~8mA
	High voltage inspection input port	3 terminals, AC/DC 110V
	Digital output port	12 terminals, DC30V/5A,,AC250V/5A Parts can use programmable logic control: PLC programmable control mode
	CAN communication interface	3 terminals
	Encoder interface	Built-in cosine, collector NPN output, push-pull output encoder interface
Technology	Control mode	PG vector control
	Overload capacity	150% of rated current: 60s 180% of rated current: 10s
	Starting torque	PG vector control: 0Hz/150%
	Speed control precision	PG vector control: ±0.1% of the Max. speed
	Carrier frequency	1.0kHz~16.0kHz
Function	Running mode	Fast speed mode, Inspection mode, returning to leveling mode, leveling after opening mode and UPS mode

Item	Name	Specification
	Stopping mode	Stop at the distance control principles
	Starting torque compensation	Smooth starting without weighting devices. Apply speed loop and position loop
	Master self-study mode	Static and dynamic autotuning
	Hoistway self-study mode	Record the position of floor and forced deceleration switch
	Auto-voltage adjustment	Keep the output voltage when the voltage of grid changes
Operation and monitoring	Operational keypad	2-digit LED, 8 lights and 2 buttons Fault inquiry
	Manual controller	Parameters setting, upload, download and fault inquiry and manual calling
	Software of upper PC	Parameters setting, upload, download and fault inquiry, manual calling and parameter monitoring

3.5 Delivery confirmation

Serial No.	Items	Method
1	The received product is in accordance with the ordered.	Confirm by the model in the nameplate
2	Whether there is damage.	Check the appearance
3	Whether there is loose screws.	Check the tightening point with screw drives
4	Open the front cover and check whether the control board is loose.	Check the tightening point with screw drives

Please contact with us if anything is wrong.

3.6 Digitron displaying and operation instruction

Figure 3-1   Digitron

State instructions:

No	Code	Meaning	Instruction
1	UP	Elevator upward	Keep on when elevator upward
2	DN	Elevator downward	Keep on when elevator downward
3	DO	Door open	Flash when door is opening and keep on when the door is open
4	DC	Door closed	Flash when the door is closing and keep on when the door is closed.
5	CC	Car communication	Keep on when the communication between EC100 and car is established.
6	LC	Lock indicator	Keep on when locking
7	DZ	Door zone	Keep on when the elevator is entering into the door zone.
8	ER	Elevator error	Flash when elevator error

The LED displaying is defaulted as the current floor when there is no fault, while fault occurs, Er is flashing and LED will report the fault code directly, such as ⎓⎓ and flashing. Press UP key to watch the previous fault and the fault code will flash; press UP key to watch the next fault. Press DOWN key to reset from the fault history and enter into the floor displaying. In the maintenance state, if the elevator is in the bottom floor, dialing the maintenance switch for three times in 5 seconds will clear the fault history.

3.7 Running environment

3.7.1 Temperature & Humidity

Environment temperature range: -10°C ~ +40°C. Derate 4% for every additional 1℃ if ambient temperature exceeds 40°C. The highest temperature is 50℃.

Humidity≤90% RH. No condensation is allowed.

3.7.2 Altitude

The machine can output the rated power when installed with altitude of lower than 1000m. It will be derated when the altitude is higher than 1000m. For details, please refer to the following figure:
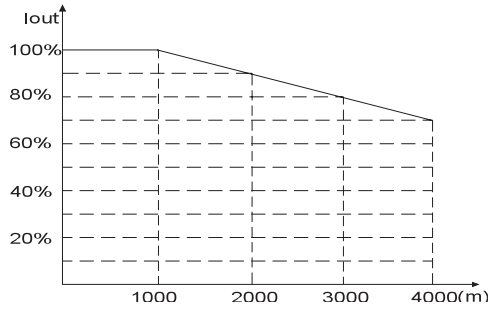
Figure 3-2 Rating curve

3.7.3 Other environmental requirements

It is not allowed that the inverter falls down or suffers from fierce impact or the inverter installed at the place that oscillation frequently. The maximum swing should less than 5.8m/Ss2 (0.6g).

Keep away from the electromagnetic radiation source.

Do not install the inverter at the wringing or dewfall place.

Keep away from air pollution such as dusty, corrosive gas.

Do not store the inverter in the environment with direct sunlight, vapor, oil fog and vibration

Chapter 4 Installation and wiring

This chapter describes the terminals configuration, including main circuit terminal configuration, control circuit terminals configuration and PG terminals configuration.

⚡	◆ Follow the guidelines of these manual and only professional electricians are allowed to operate, otherwise electric shock may occur. ◆ Breaker is needed between the power supply and the machine, otherwise fire may occur. ◆ Please ensure the power supply is disconnected before wiring, otherwise the electric shock may occur. ◆ The grounding terminal should be reliable, otherwise electric shock may occur. ◆ Do not touch the terminals with hands, otherwise electric shock may occur. ◆ Do not connect the power supply with U/V/W, otherwise damage may occur. ◆ Do not connect the wires of braking resistor with the terminals (+) (-) of DC bus, otherwise electric shock and fire may occur.
⚠	◆ Please confirm the voltage degree of the power is in accordance with that of the machine, otherwise damage may occur. ◆ All terminals connected with the machine should be tightened enough, otherwise damage may occur. ◆ Ensure there is no object falling into the machine in the process of configuration and installation, otherwise damage may occur.

4.1 Dimension and size
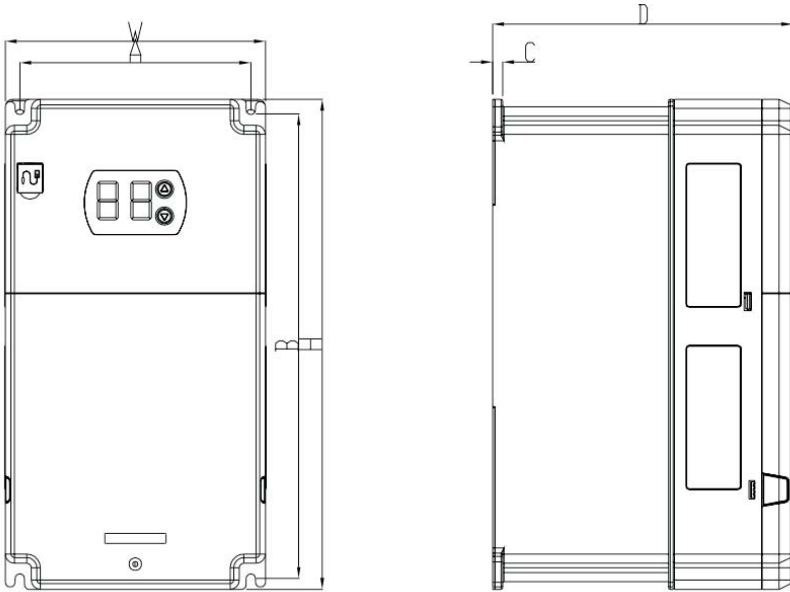
Figure 4-1 Installation dimension of EC100 elevator intelligent integrated machine

Model	W(mm)	H (mm)	D (mm)	A (mm)	B (mm)	C (mm)	Hole size (mm)	Screw bolt
EC100-1R5-S2	170	320	197	151	303	6.5	6.5	M6
EC100-2R2-S2	170	320	197	151	303	6.5	6.5	M6
EC100-004-4	170	320	197	151	303	6.5	6.5	M6
EC100-5R5-4	170	320	197	151	303	6.5	6.5	M6
EC100-7R5-4	170	320	197	151	303	6.5	6.5	M6
EC100-011-4	170	320	197	151	303	6.5	6.5	M6
EC100-015-4	230	330	197	210	311	6.5	6.5	M6

EC100-018-4	230	330	197	210	311	6.5	6.5	M6
EC100-022-4	255	400	226	237	384	10	6.5	M6
EC100-030-4	255	400	226	237	384	10	6.5	M6
EC100-037-4	270	555	325	130	540			
EC100-045-4	270	555	325	130	540			
EC100-055-4	270	555	325	130	540			

⚠	When design the control cabinet, the left and right space should be no less than 50mm and the above and below space should be no less than 100mm to ensure enough cooling.

4.1.1 Terminals instruction
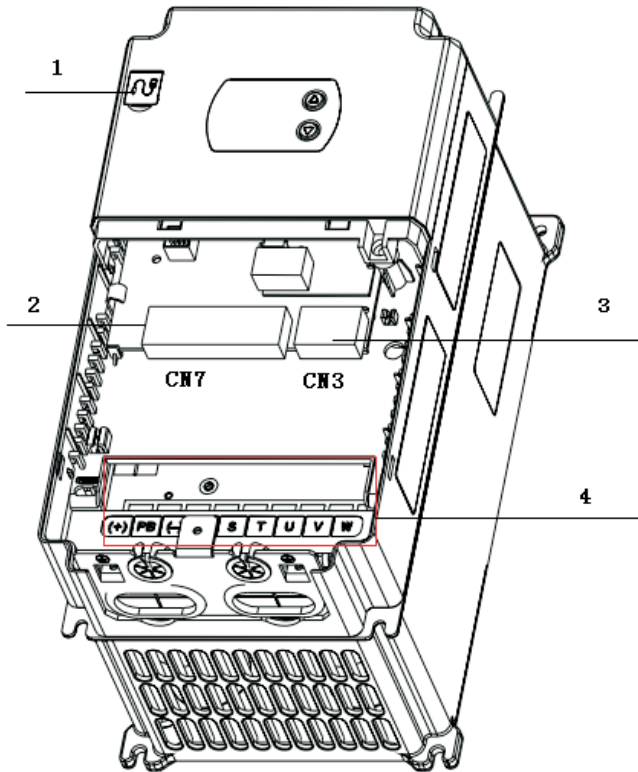
Figure 4-2 Terminals

No	Code	Name	Remarks
1	CN2	Terminal only for manual operation	Use specific cables when connecting with computer
2	CN7	DB62 terminal	Digital input/output, CAN communication , I/O board
3	CN3	Terminal for synchronous master encoder	ERN1387 or incremental encoder
4		Main circuit terminals	See 4.2.1 for the terminals arrangement.

4.2 Main circuit terminals

4.2.1 Terminal arrangement
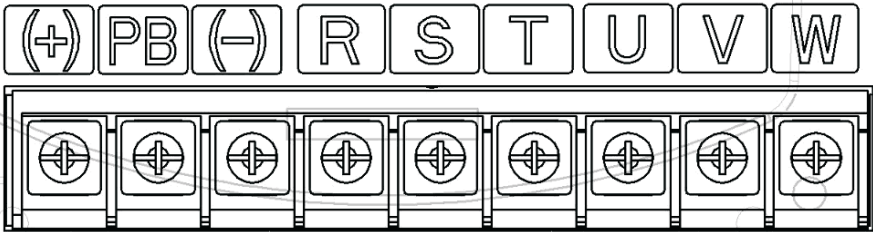
Figure 4-3 EC100 terminals (7.5kW~18.5kW)
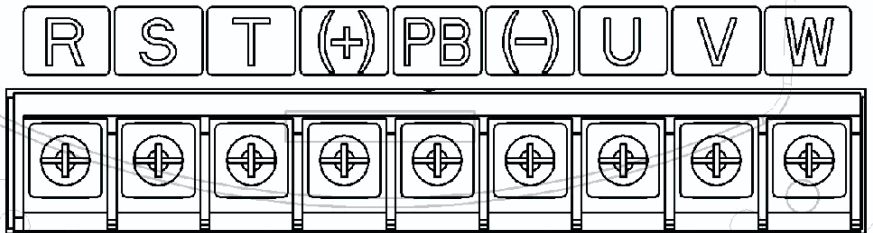
Figure 4-4 Figure 4-3 EC100 terminals (22kW~30kW)

4.2.2 Function instruction

Name	Function
R, S, T	3-phase power input terminals
(＋), (−)	DC bus negative and negative poles
(＋), PB	Wiring terminals of braking resistor
U, V, W	3-phase AC output terminals
⏚	Grounding terminal

4.2.3 Specification of the main circuit leads

Model	Input leads (mm²)	Output leads (mm²)	Grounding leads (mm²)
EC100-1R5-S2	2.5	2.5	2.5
EC100-2R2-S2	4	4	4
EC100-004-4	4	4	4
EC100-5R5-4	4	4	4
EC100-7R5-4	4	4	4
EC100-011-4	6	6	4
EC100-015-4	10	10	10
EC100-018-4	16	16	16
EC100-022-4	16	16	16
EC100-030-4	25	25	16
EC100-037-4	25	25	16
EC100-045-4	35	35	16
EC100-055-4	50	50	25

4.2.4 Configuration precautions

⚠	◆ Connect according to the terminal grade. Shorten the length as short as possible to avoid leakage. ◆ Apply standard 3-phase 5-wire power supply. Ground the grounding terminals with proper techniques. It is recommended to use multiple twisted copper wires and ensure the specific grounding resistor is no more than 4Ω. Do not use it with other devices. ◆ Do not short circuit or ground the input/output circuits. ◆ The output terminal of the machine needs to go through the ground metal pipe and route separately with the signal wires of the control circuit to avoid interference.

4.2.5 Connection of the control circuit of intelligent integral machine in the main circuit

The machine is embedded with braking unit. In order to release the regenerative energy, it is necessary to connect braking resistor in the terminal of (+) and PB.

The temperature of the braking resistor will increase as the heat-releasing. Ensure safety protection and good ventilation when installing braking resistor.

3-phase input power AC 400V 15% 50/60Hz
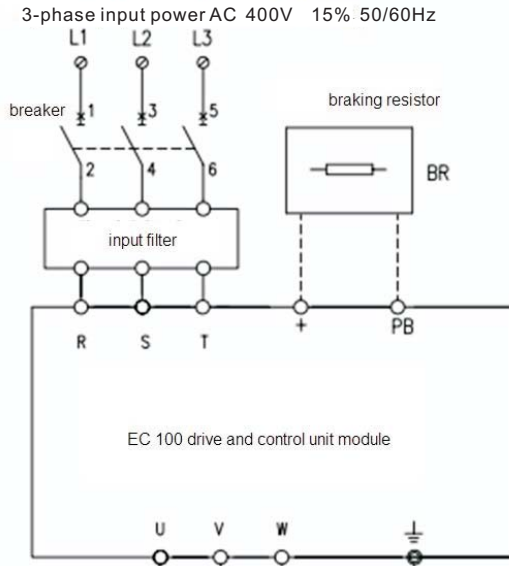
Figure 4-5 Connection diagram of braking resistor and braking unit

⚠	◆ (+) and (-) can not be connected with the braking resistor directly, otherwise damage to the machine or fire may occur.

4.2.6   Connection of the RBU series energy feedback unit

RBU series energy feedback unit can feedback the power generated from the motor to the grid. The connection is shown as below:
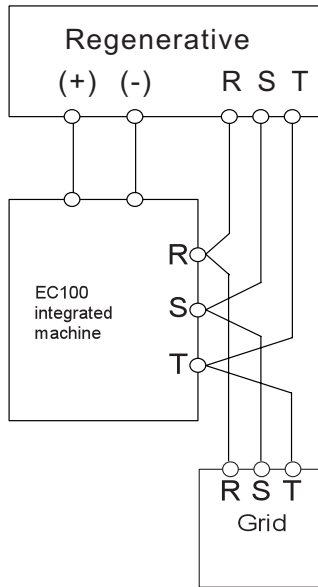
Figure 4-6 Connection diagram of the energy feedback unit

4.2.7 Connection of the PE terminal

The PE terminal needs to be grounded with proper techniques to avoid electric shock and fire. The resistance is less than 10Ω.

4.3 Instruction of EC100-I/O board

4.3.1 Appearance and terminal arrangement of I/O board
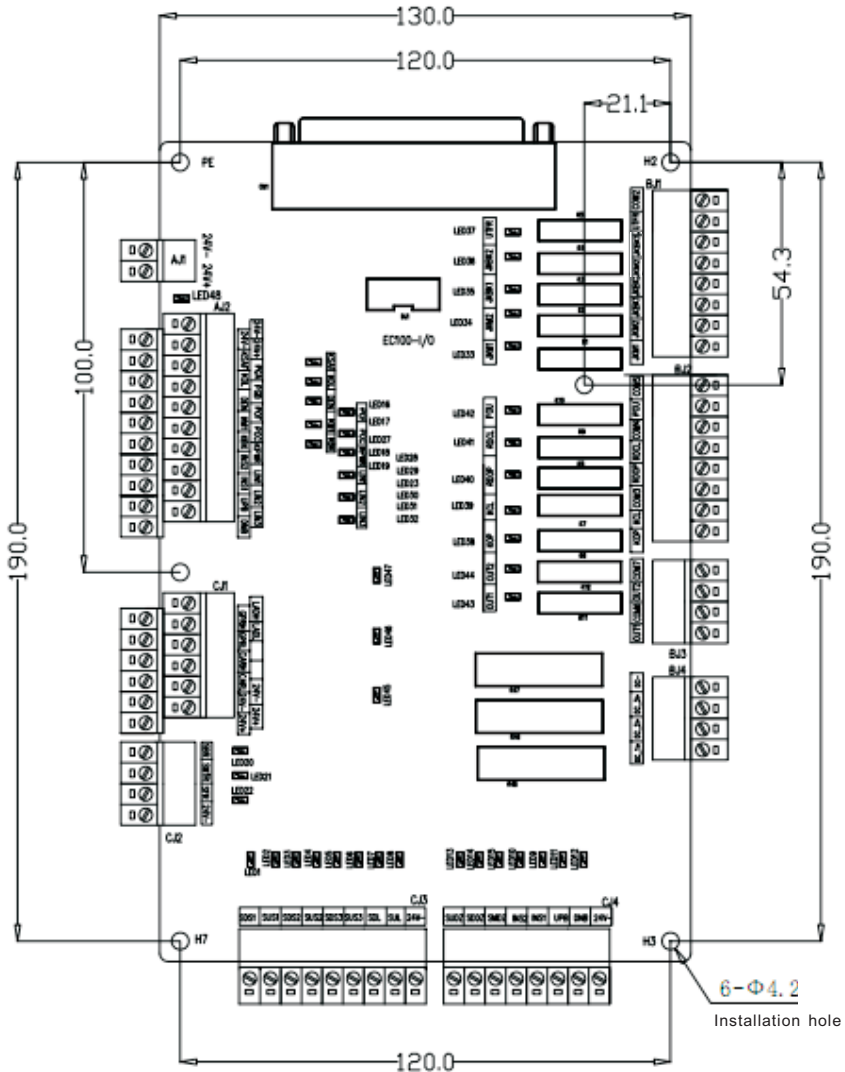
Figure 4-7   Appearance and terminal arrangement of I/O board

Terminals:

Terminal No	Terminal name	Remarks	Terminal No	Terminal name	Remarks
CN1	62-core connection interface		CJ3	Hoistway switch signal acquisition interface	
AJ1	Input interface of DC24Vpower supply		CJ4	Car /car top signal acquisition interface	
AJ2	Asynchronous PG input interface Feedback test of the input terminal contactor in the cabinet		DJ1	Spare	
CJ1	Car, group control and calling communication interface		BJ1	Drive part of the contact output control port of the drive part	
CJ2	Fire input		BJ2	Output interface of the switch door	
	Motor monitoring interface		BJ3	Spare output interface	
			BJ4	High voltage detection interface of safe circuit	

4.3.1.1 Terminal definition of I/O board

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
AJ1 terminals 1-2	1	24V power supply -	24V-	LED48 green	Power input
	2	24V power supply +	24V+		
AJ2 upper terminals 1-10	1	Encoder power supply 24V-	24V-		Asynchronous master encoder input Power supply DC24V
	2	Encoder power supply 24V+	24V+		
	3	Encoder input A phase	PGA		
	4	Encoder input B phase	PGB		
	5	Open door feedback	POF	LED28	Default NO input
	6	Door detection	POC	LED29	Default NC input
	7	UPS detection	KPWR	LED23	Default NO input
	8	Spare input 1	LIN1	LED30	Default NO input

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
	9	Spare input 2	LIN2	LED31	Default NO input
	10	Spare input 3	LIN3	LED32	Default NO input
AJ2 lower terminals 1-10 pin	1	Input common terminal 24V-			
	2	Contact detection of the safe contractor	KSAF	LED16	Default NO input
	3	Contact of the door lock contactor	KDL	LED17	Default NO input
	4	Intelligent integral machine enabling	DEN	LED27	Default NO input
	5	Contact detection of output contactor of the drive	KM1	LED18	Default NC input
	6	Contact detection of the brake contactor	KBK	LED19	Default NC input

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
	7	Emergency power running(off)	INS2	LED10	Inspection signal input of the control cabinet
	8	Inspection signal(off)	INS1	LED9	
	9	Control cabinet inspection UP button input	UPB	LED11	
	10	Control cabinet inspection DOWN button input	DNB	LED12	
CJ1 lower terminals 1-6	1	Group control GPRH	GPRH		Group control communication
	2	Group control GPRL	GPRL		
	3	Car communication CARH	CARH		Car communication
	4	Car communication CARL	CARL		

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
	5	Car communication power 24V-	24V-		Communication power
	6	Car communication power 24V+	24V+		
CJ1 upper terminals 1-6	1	Outbound communication LADH	LADH		Outbound communication
	2	Outbound communication LADL	LADL		
	3	Null			
	4	Null			
	5	Power supply of outbound communication 24V-	24V-		Outbound communication the load current is less than 2A. If it is above 2A, select the switch power.
	6	Power supply of outbound communications 24V+	24V+		

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
CJ2 terminal1 -4 pin	1	Braking travel switch detection	SBR	LED20	Default NC input
	2	Motor thermal protection	SMTR	LED21	Default NO input
	3	Fire action input	SFR	LED22	Default NO input
	4	Input common terminal 24V-	24V-		
CJ3 terminals 1-9 hoist-way switch	1	Low speed down forced speed-changing switch	SDS1	LED1	Default NC input
	2	Low speed up forced speed-changing switch	SUS1	LED2	Default NC input
	3	Medium speed down forced speed-changing	SDS2	LED3	Default NC input

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
		switch			
	4	Medium speed up forced speed-changing switch	SUS2	LED4	Default NC input
	5	High speed down forced speed-changing switch	SDS3	LED5	Default NC input
	6	High speed up forced speed-changing switch	SUS3	LED6	Default NC input
	7	Down limit	SDL	LED7	Default NC input
	8	Up limit	SUL	LED8	Default NC input
	9	Input common terminal 24V-	24V-		Common terminal of hoistway switch digital input

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
CJ4 Car info interface 1-8	1	Up door area (rear door opening detection)	SUDZ	LED13	Default NO input
	2	Down door area	SDDZ	LED14	Default NO input
	3	Middle door area	SMDZ	LED15	Default NO input
	4	Inspection signal 2	INS2	LED10	Default NC input
	5	Inspection signal 1	INS1	LED9	Default NC input
	6	Up inspection button signal	UPB	LED11	Default NO input
	7	Down inspection button signal	DNB	LED12	Default NO input
	8	Common terminal of car information 24V-	24V-		
BJ1 terminals	1	Intelligent integrated machine	JKM1	LED33	

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
1-8		output contactor control 1			
	2	Intelligent integrated machine output contactor control 2	JKM2	LED34	
	3	Braking contactor control 1	JKBK1	LED35	
	4	Braking contactor control 2	JKBK2	LED36	Braking forced
	5	1, 3, 4 pin common terminals	COM1		
	6	2 pin common terminal	COM0		
	7	Fire return	1FR	LED37	Fire return output
	8	7 pin common terminal	COM2		

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
BJ2 terminals 1-8	1	Front door opening	KOP	LED38	Front door control
	2	Front door closing	KCL	LED39	
	3	1-2 pin common terminal	COM3		
	4	Rear door open	RDOP	LED40	Rear door control
	5	Rear door closed	RDCL	LED41	
	6	4-5 pin common terminal	COM4		
	7	Open door output	POU	LED42	Lock short circuit
	8	7 pin common terminal	COM5		
BJ3 terminals 1-4	1	Customized output 1	OUT1	LED43	Programmable control relay 1 (Low speed signal can be set)
	2	1 pin common terminal	COM6		

Plug-in No.	Pin No.	Interface definition	Code	LED indicator code	Remarks
	3	Customized output 2	OUT2	LED44	Programmable control relay 1 (UPS output can be set)
	4	3 pin common terminal	COM7		
BJ4 terminals 1-4	1	High voltage input detection of the safe circuit	DC_1+	LED45	AC110V/DC110V input
	2	High voltage detection of car lock	DC_2+	LED46	AC110V/DC110V input
	3	High voltage detection of door lock	DC_3+	LED47	AC110V/DC110V input
	4	High voltage detection input common terminal	DC-		

4.3.2 Technical specification of the switch input signal

Input		Open input light and electric separation
Current signal	"0" electric level	0~2mA
	"1" electric level	4.5~8mA
Voltage signal	"0" electric level	18~24V DC
	"1" electric level	0~5V DC
Signal data filter delay		30mS
Signal response frequency		200Hz

4.3.3 Technical specification of the relay switch input signal

Output mode	Relay output
AC	250V AC
DC	110V DC
Inductive load	3 A
Resistor load	5 A
Electrical life	300,0000 times
Mechanical life	1000,0000 times

4.4 Encoder wiring

4.4.1 Asynchronous master wiring

When using the asynchronous master, please use the encoder of DC24V and the push or open collector output. The interface of the encoder will be connected with AJ2, which is shown as below:
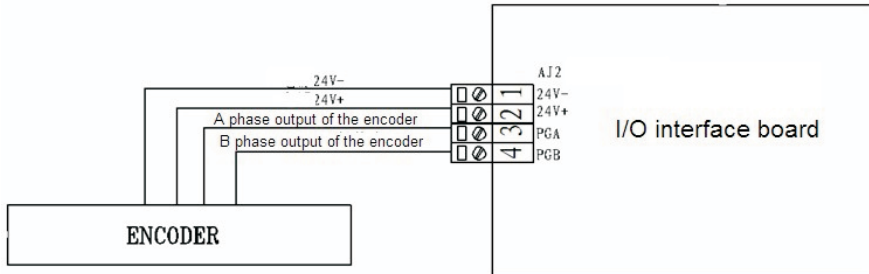
Figure 4-8 Encoder wiring of the asynchronous master

4.4.2 Synchronous master wiring

When using the synchronous master, please use the encoder of DC5V and the interface is connected with terminal DB15 of the intelligent integral machine. There are two types of encoders:

➢ It is recommended to install the encoder, such as the cosine rotary encoder, for example, HEIDENHAIN ERN1387;

➢ U, V and W encoder: the polarity number of the encoder should be the same with that of the motor. If using the encoder, it is necessary to install the compensation devices.

The encoder wiring diagram of the synchronous master is shown as follows:
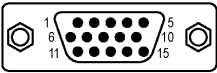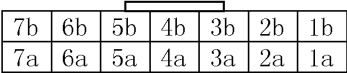
	DB15 pin		Socket of 1387 encoder	
			7b 6b 5b 4b 3b 2b 1b 7a 6a 5a 4a 3a 2a 1a	
Pin	SIN/COS	UVW		
1	B−	B−	5a	B−
2	null	null		
3	R+	Z+	4b	R+（Z+）
4	R−	Z−	4a	R−（Z−）
5	A+	A+	6b	A+
6	A−	A−	2a	A−
7	0V	0V	3a+5b	0V
8	B+	B+	3b	B+
9	5V	5V	7a+1b	5V
10	C−	U−	1a	C−（SIN−）
11	C+	U+	7b	C+（SIN+）
12	D+	V+	2b	D+（COS+）
13	D−	V−	6a	D−（COS−）
14	null	W+		
15	null	W−		

Figure 4-9 SIN/COS and UVW encoder wiring diagram of the synchronous master

Note	◆ Please select the twisted shield pairs and the shield level can only be grounded with one side. ◆ Avoid the power cables when configuration, and shorten the length of the cable and through the metal pipes.

4.5 The system installation and configuration

4.5.1 Electrical installation of the hoistway

Install a leveling switch SMDZ on the top of the car and a plate with the length of 120~300 mm in each floor. When the car is leveling, the plate is in the middle of the leveling switch.

For the elevators with different speed, install forced deceleration switch. Install SDS1 and SUS1 for the elevator with speed less than 1.5m/s; install SDS2 and SUS2 for the elevator with speed of 1.75m/s~2.0m/s; Install SDS3 and SUS3 for the elevator with speed more than 2.0m/s. (in order to avoid shock, bitable magnetic switch is available). The installation position in figure 4-5 means the distance between the car and the leveling when the switch action is valid. Install up leveling switch SUDZ and down leveling switch SDDZ on the top of the car for the elevator with relieving.

Install a SDL and SDFL on the top floor; install a SUL and SUFL on the ground floor.

4.5.2 Position diagram for the hoistway switch installation

See the table below for the switch installation distance.

Rated speed / Force deceleration distance	≤0.5m/s	≤1.5m/s	≤2.0m/s	≤2.5m/s
L1 force deceleration distance at low speed	0.7m	1.2m	1.2m	1.2m
L2 force deceleration distance at medium speed	—	—	2.2m	2.2m
L3 force deceleration distance at high speed	—	—	—	4.5m

⚠	◆ Note that the plugging depth of the plate to the standard line when apply magnetic switch for SMDZ. ◆ The NO/NC state of the leveling switch can be changed through modifying the input logic of the controller.
Note	◆ The table above lists the recommended position if the general forced deceleration switch.
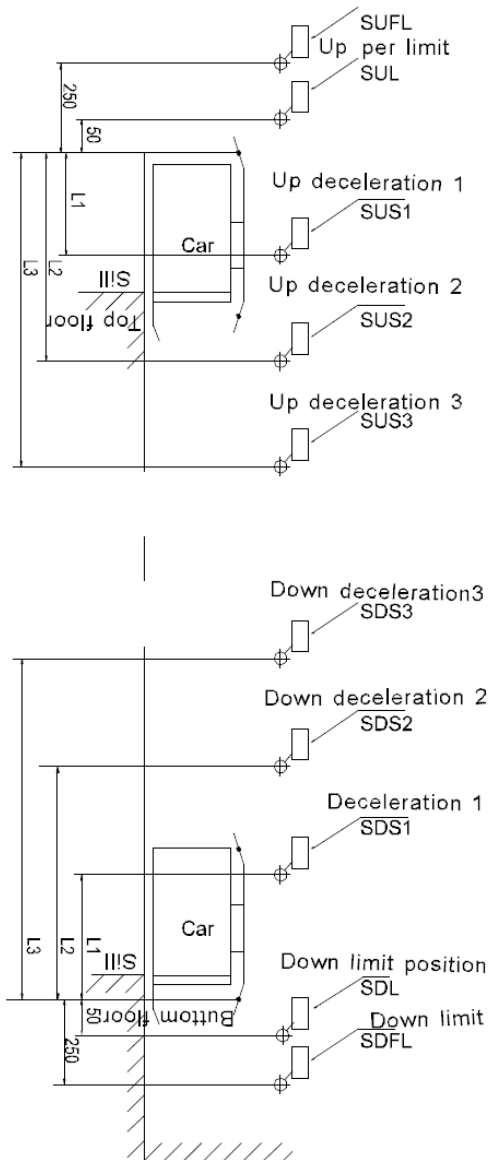
Figure 4-10 Installation position of the hoistway switch

4.5.3 Connection diagram of peripheral devices in control system
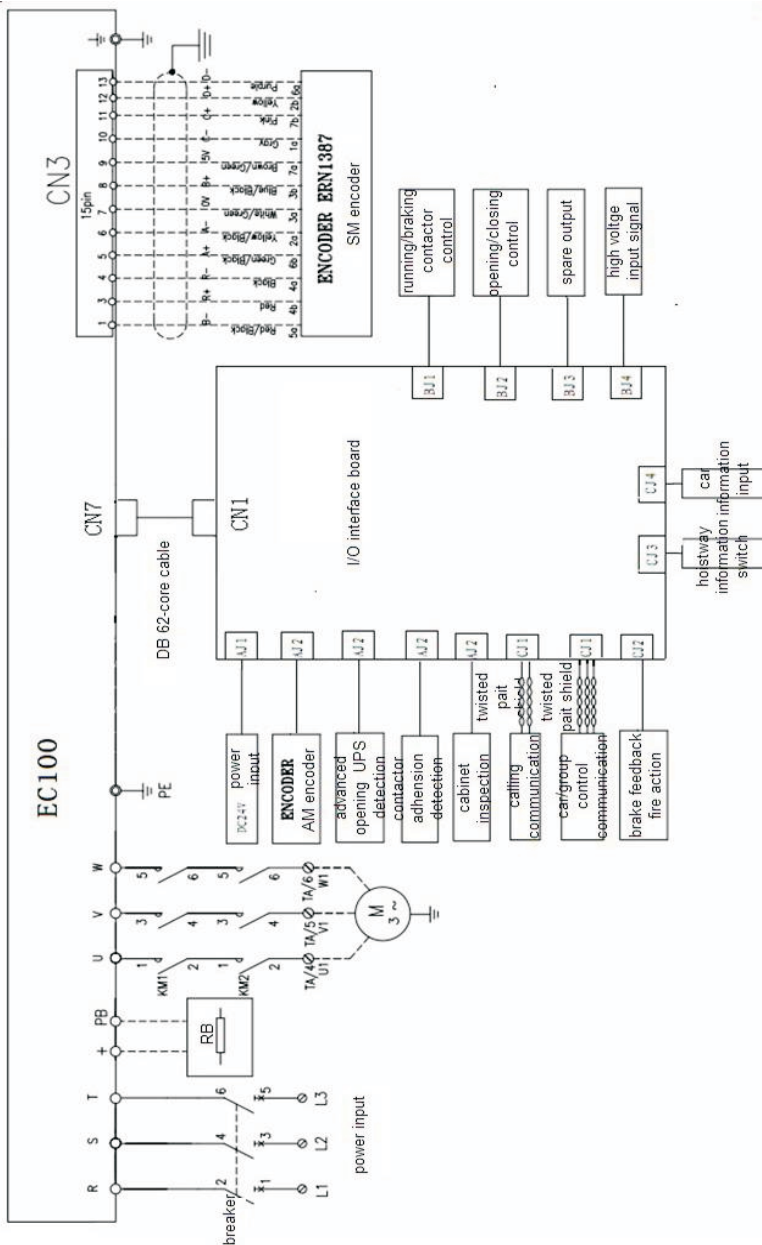
4.5.4 Connection precautions

4.5.4.1 Power supply

The voltage of the power supply corresponds to the rated voltage of the machine

Fluctuation range ≤ 7%

4.5.4.2 Breaker

The breaker is needed between the power supply and the input terminals of the integrated machine.

The capacity of the breaker is 1.5~2 times of the rated current of the intelligent integrated machine.

4.5.4.3 AC reactor at the input side

Improve the power factor of the power supply and reduce the harmonic current.

4.5.4.4 Filter at the input side

Suppress the interference caused by high-frequency noise .

4.5.4.5 Output contactor in the main circuit

Control the current of the tractor. It is recommended to refer to the electrical diagram of our company install two contactors.

4.5.4.6 Filter at the output side

Suppress the noise interference and the leakage current.

4.5.4.7 AC reactor at the output side

Suppress the RF interference.

4.5.5 CAN communication configuration

There are 4 cables for communication in the hoistway and the following cable. The calling communication is 24V+, 24V-, LADH and LADL and the car communication is 24V+, 24V-, CARL and CARH.

In order to avoid short circuit, measure with millimeter to ensure if circuit is present between the 4 cables and others before power on, especially the power cable of 24V, 36V, 110V, 220V, 80V.

24V power supply is provided to the branch. The diameter is equal to or more than $0.75mm^2$. In higher floor (higher than 25th floor), reduce the voltage drop and ensure the farthest external power voltage is more than 20V.

Twisted-pair specifications: Characteristic impedance 120Ω; The allowable range 108~132Ω

Stranding pitch: ≤30mm   Diameter: ≥0.75mm^2

If the parallel distance between the communication and power cables is longer than 5m, there should be a 30cm space to prevent power interface.

Note	◆ If the electric wire and weak wire are configured parallel, put the electric together on one side and the weak wires together on the other side. Use grounding wires to separate them.
⚠	◆ Do not plug the CAN bus plug (24V＋, 24V－, CANH and CANL)when power on, otherwise permanent damage to the components may occur. ◆ Abnormal communication may occur for wrong setting of the terminal resistor. ◆ In general, the resistor between CANH and CANL is about 60Ω.
Note	◆ CAN communication cable is twisted pair and the twisted distance is less than 30mm. ◆ CAN bus communication is away from electric wire; the communication power cable, communication cable and electric wire can not be twisted. ◆ CAN communication cable can not connect with other circuit or grounding wire. ◆ The specific CAN communication power cable is separated from

	24V power of the controller.
	◆ The outside/inside calling board is collector open-drain output and only applied for loads such as LED. If the elevator is made from old ones, change the button.
	◆ Refer to the electrical diagram for detailed configuration.

4.6 Installation guideline to EMC compliance

4.6.1 General knowledge of EMC

EMC is the abbreviation of electromagnetic compatibility, which means the device or system has the ability to work normally in the electromagnetic environment and will not generate any electromagnetic interference to other equipments.

EMC includes two subjects: electromagnetic interference and electromagnetic anti-jamming.

According to the transmission mode, Electromagnetic interference can be divided into two categories: conducted interference and radiated interference.

Conducted interference is the interference transmitted by conductor. Therefore, any conductors (such as wire, transmission line, inductor, capacitor and so on) are the transmission channels of the interference.

Radiated interference is the interference transmitted in electromagnetic wave, and the energy is inverse proportional to the square of distance.

Three necessary conditions or essentials of electromagnetic interference are: interference source, transmission channel and sensitive receiver. For customers, the solution of EMC problem is mainly in transmission channel because of the device attribute of disturbance source and receiver can not be changed.

4.6.2 EMC features of inverter

Like other electric or electronic devices, inverter is not only an electromagnetic interference source but also an electromagnetic receiver. The operating principle of inverter determines that it can produce certain electromagnetic interference noise. And the same time inverter should be designed with certain anti-jamming ability to ensure the smooth working in certain electromagnetic environment. The following is its EMC features:

● Input current is non-sine wave. The input current includes large amount of high-harmonic waves that can cause electromagnetic interference, decrease the grid power factor and increase the line loss.

● Output voltage is high frequency PMW wave, which can increase the temperature rise and shorten the life of motor. And the leakage current will also increase, which can lead to the leakage protection device malfunction and generate strong electromagnetic interference to influence the reliability of other electric devices.

● As the electromagnetic receiver, too strong interference will damage the inverter and influence the normal using of customers.

● In the system, EMS and EMI of inverter coexist. Decrease the EMI of inverter can increase its EMS ability.

4.6.3 EMC installation guideline

In order to ensure all electric devices in the same system to work smoothly, this section, based on EMC features of inverter, introduces EMC installation process in several aspects of application (noise control, site wiring, grounding, leakage current and power supply filter). The good effective of EMC will depend on the good effective of all of these five aspects.

4.6.3.1 Noise control

All the connections to the control terminals must use shielded wire. And the shield layer of the wire must ground near the wire entrance of inverter. The ground mode is 360 degree annular connection formed by cable clips. It is strictly prohibitive to connect the twisted shielding layer to the ground of inverter, which greatly decreases or loses the shielding effect.

Connect inverter and motor with the shielded wire or the separated cable tray. One side of shield layer of shielded wire or metal cover of separated cable tray should connect to ground, and the other side should connect to the motor cover. Installing an EMC filter can reduce the electromagnetic noise greatly.

4.6.3.2 Site wiring

Power supply wiring: the power should be separated supplied from electrical transformer. Normally it is 5 core wires, three of which are fire wires, one of which is the neutral wire, and one of which is the ground wire. It is strictly prohibitive to use the same line to be both the neutral wire and the ground wire

Device categorization: there are different electric devices contained in one control cabinet, such as inverter, filter, PLC and instrument etc, which have different ability of emitting and withstanding electromagnetic noise. Therefore, it needs to categorize these devices into strong noise device and noise sensitive device. The same kinds of device should be placed in the same area, and the distance between devices of different category should be more than 20cm. Wire Arrangement inside the control cabinet: there are signal wire (light current) and power cable (strong current) in one cabinet. For the inverter, the power cables are categorized into input cable and output cable. Signal wires can be easily disturbed by power cables to make the equipment malfunction. Therefore when wiring, signal cables and power cables should be arranged in different area. It is strictly prohibitive to arrange them in parallel or interlacement at a close distance (less than 20cm) or tie them together. If the signal wires have to cross the power cables, they should be arranged in 90 angles. Power input and output cables should not either be arranged in interlacement or tied together, especially when installed the EMC filter. Otherwise the distributed capacitances of its input and output power cable can be coupling each other to make the EMC filter out of function.

4.6.3.3 Grounding

Inverter must be ground safely when in operation. Grounding enjoys priority in all EMC methods because it does not only ensure the safety of equipment and persons, but also is the simplest, most effective and lowest cost solution for EMC problems.

Grounding has three categories: special pole grounding, common pole grounding and series-wound grounding. Different control system should use special pole grounding, and different devices in the same control system should use common pole grounding, and different devices connected by same power cable should use series-wound grounding.

4.6.3.4 Leakage Current

Leakage current includes line-to-line leakage current and over-ground leakage current. Its value depends on distributed capacitances and carrier frequency of inverter. The over-ground leakage current, which is the current passing through the common ground wire, can not only flow into inverter system but also other devices. It also can make leakage current circuit breaker, relay or other devices malfunction. The value of line-to-line leakage current, which means the leakage current passing through distributed capacitors of input output wire, depends on the carrier frequency of inverter, the length and section areas of motor cables. The higher carrier frequency of inverter, the longer of the motor cable and/or the bigger cable section area, the larger leakage current will occur.

Countermeasure:

Decreasing the carrier frequency can effectively decrease the leakage current. In the case of motor cable is relatively long (longer than 50m), it is necessary to install AC reactor or sinusoidal wave filter at the output side, and when it is even longer, it is necessary to install one reactor at every certain distance.

4.6.3.5 EMC Filter

EMC filter has a great effect of electromagnetic decoupling, so it is preferred for customer to install it.

For inverter, noise filter has following categories:

- Noise filter installed at the input side of inverter;
- Install noise isolation for other equipment by means of isolation transformer or power filter.

4.6.4 Installation specification

If user install inverter and EMI filter according to the installation guideline, we believe inverter system comply with following compliance.

- EN61000-6-4; EN61000-6-3; EN61800-3

Chapter 5 Debugging tools

5.1 Instruction

Manual controller is the specific debugging tools for system debugging and maintenance. It consists of LCD display and keys which has following functions:

5.1.1 Main controlling interface

Following elevator state can be watched through LCD displaying:

➢ The automotive, maintenance, drive, fire safety, overload and door open state

➢ Inside and outside calling signal of the elevator

➢ Floor position of the elevator

➢ Running direction of the elevator

5.1.2 Fault history

Inquiry the fault time, floor, input/output state.

5.1.3 Parameters setting

Set all the elevator parameters through the manual controller

➢ Speed setting;

➢ Motor parameters setting;

➢ Encoder parameters setting;

➢ Floor parameters setting;

➢ Comfortability and protective parameters setting;

➢ Time and function parameters setting

5.1.4 Password setting

The password of the loading page can be modified and the current password can be used to modify the current password and the lower grade password.

5.1.5 System autotuning

Relative elevator autotuning:

➢ Hoistway autotuning

➢ Static autotuning of the elevator

➢ Rotating autotuning of the motor

➢ Weighting autotuning of the elevator

5.1.6 Data management

➢ Data storage

➢ Factory setting restore

➢ Fault history clearance

5.2 Connection method
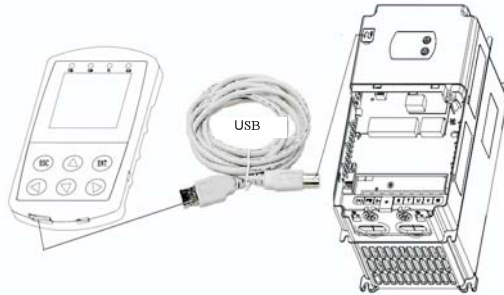
Figure 5-1 Interface of the manual controller and EC100

5.3 Keys and LED indicator

5.3.1 Key definition

Figure 5-2 Appearance and key definition

5.3.2 Manual controller and LED indicator

Serial No.	No	Meaning	Instruction
1	COM	Connection signal of manual controller and EC100	On when normal communication
2	CAN	Connection signal of manual controller and the car	On when normal communication
3	PC	Connection signal of manual controller and the computer	On when normal communication
4	ALM	Connection fault	Flash when no communication

5.4 Operational procedure flowchart
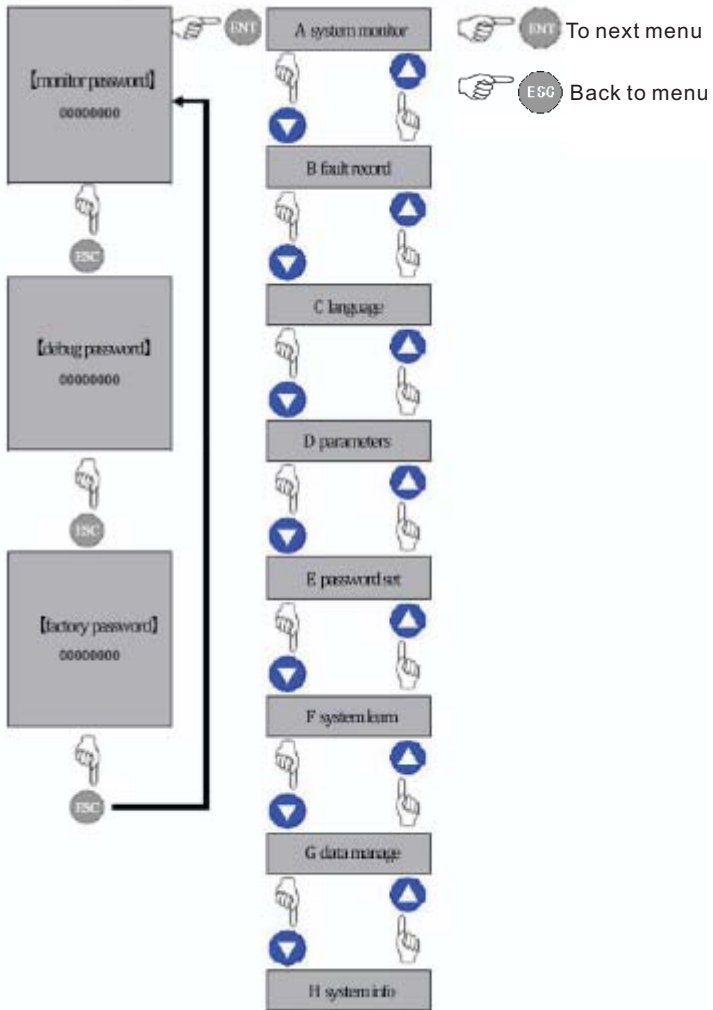
Figure 5-3 Procedure flowchart

Chapter 6 Function parameters

6.1 Original debugging interface
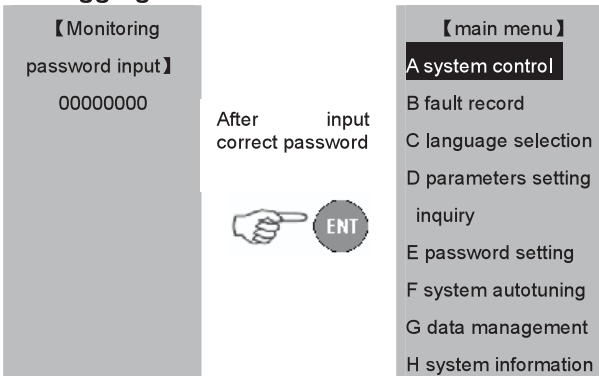
【Monitoring password input】
00000000

After input correct password

【main menu】
A system control
B fault record
C language selection
D parameters setting
 inquiry
E password setting
F system autotuning
G data management
H system information

The monitoring password can only enter into A, B and H in the main menu and they are only for read.

After inputting the monitoring password, pressing ESC can shift into the password debugging or factory password input mode.

【Monitoring password input】
00000000

【Debugging password input】
00000000

The original value of monitoring password and debugging password is 00000000.

If it is necessary to shift into the other modes after password entering, power off and enter again.

6.2 System monitoring

6.2.1 System monitoring --- calling and running state

6.2.1.1 Calling state

After entering into the calling and running state, move the cursor into the called floor number, press ENT to record the car calling and press DOWN to enter the lower button and press UP to enter the upper button.

【main menu】		【system control】		Auto opening
A system control	☞ ENT	[1] calling and	☞ ENT	Floor: 1 0mm/s
B fault record		running state		Height: 0mm
C language		[2] random running		Leveling distance:
selection		[3] drive state		100mm
D parameters setting		[4] main controller		1234567890 1234567890
inquiry		[5] car controller		↑
E password setting				↓
F system autotuning				1234567890 1234567890
G data management				
H system				
information				

6.2.1.2 Monitoring system--Running state

Auto   opening
Floor: 1   0mm/s
Height: 0mm
Leveling   distance:
100mm
1234567890 1234567890
       ↑
       ↓
1234567890 1234567890

The interface will display the state of the elevator such as auto, maintenance, fire safety, drive, overload, door locked, fault and full load, the current floor and height, the leveling distance and the state of door operator.

Move the cursor onto the floor in need of landing calling, and then press ENT to record car commands. The up arrow stands for the current recorded UP command while the down arrow stands for the current recorded DOWN command.

6.2.2 Monitoring system---random running

After entering into the interface, the elevator is in the random running state automatically.

Auto   opening
Floor: 1   0mm/s
Height: 0mm
Leveling   distance:
100mm
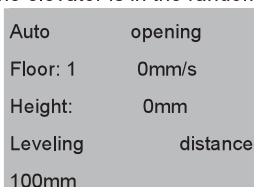
```
1234567890 1234567890
          ↑
          ↓
1234567890 1234567890
```

6.2.3 Monitoring system---driving state

【main menu】		【system control】		【drive state】
A system control	ENT	[1] calling and	ENT	1. Reference speed:
B fault record		running state		0mm/s
C language selection		[2] random running		2. Feedback speed:
D parameters setting		[3] drive state		0mm/s
inquiry		[4] main controller		3. Reference frequency:
E password setting		[5] car controller		000.00Hz
F system autotuning				4. Output frequency:
G data management				000.00 Hz
H system information				5. Output speed:
				0rpm
				6. Output current:
				0000.0A
				7. Output voltage
				000.0V
				8. Output power:
				000.0kW
				9. Bus voltage: 000.0V

6.2.4 Monitoring system---main controller

【main menu】		【system control】		【input signal1－32】
A system control	ENT	[1] calling and	ENT	1 2 3 4 5 6 7 8
B fault record		running state		9 10 11 12 13 14 15 16
C language selection		[2] random running		17 18 19 20 21 22 23 24
D parameters setting		[3] drive state		25 26 27 28 29 30 31 32
inquiry		[4] main controller		【output relay 1－12】
E password setting		[5] car controller		1 2 3 4 5 6 7 8
F system autotuning				9 10 11 12
G data management				【use the up/down key to
H system information				turn page and inquiry the
				state and function】

Watch the state of each point when the output/input point of I/O board changes.

【input signal 1－32】
1 low speed down forced speed-changing
2 low speed up forced speed-changing
3 middle speed down forced speed-changing
4 middle speed up forced speed-changing
5 high speed down forced speed-changing
6 high speed up forced speed-changing
7 down limit
8 up limit
9 emergency-motion

10 inspection signal
11 inspection up signal
12 inspection down signal
13 up door area
14 down door area
15 middle door area
16 contact of the safety contactor
17 contact of the door lock contactor
18 drive output contactor
19 contact of the braking contactor

20 braking travel switch
21 motor thermal protection
22 fire action input
23 UPS input signal
24 high voltage inspection of the safety circuit
25 high voltage inspection of the car door lock
26 high voltage inspection of the hall door lock
27 hardware enabling
28 advanced opening feedback
29 advanced opening adhesion

6.2.5 Monitoring system---car controller

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

ENT

【system control】
[1] calling and running state
[2] random running
[3] drive state
[4] main controller
[5] car controller

ENT

【car input signal 1－32：】
1 2 3 4 5 6 7
8 9 10 11 12 13 14 15
16

【output relay 1－12：】
1 2 3 4 5 6 7
8 9 10 11 12
【use the up/down key to turn page and inquiry the state and function】

Watch the changing of each point when the input/output point on the main car controller DC-01 board. The definition of each input/output point can be watched through the UP/DOWN keys.

6.3 Fault history record

【main menu】		【fault record】		The system state when
A system control		The first one of 3		the fault occurs.
B fault record		Fault code: 30 floors:		Input state 1:0000
C language selection		1		Input state 2:000E
D parameters setting		2010-12-10 23：24：		Input state：000
inquiry		12		Elevator speed: 0m/s
E password setting		Fault instruction:		Car position: 70mm
F system autotuning		30# safety circuit fault		Bus voltage: 0557.8
G data management		【press ENT to watch		Current when fault
H system information		the fault state】		occurs: 0000.0A
				Running frequency:
				000.0HZ
				【press ENT to return】

The fault history record: the first one stands for the latest fault and the floor stands for the elevator floor where the fault occurs. The detailed fault time and instructions can be attained by pressing ENT.

Please refer to chapter 12.6 for the other faults instructions.

6.4 Language selection

【main menu】		【language selection】
A system control		[1] Chinese
B fault record		[2] English
C language selection		
D parameters setting		
inquiry		
E password setting		
F system autotuning		
G data management		
H system information		

6.5 Parameters setting inquiry

Move the cursor into D after entering into the main menu and press ENT into the parameters setting, the main menu is as below:

【main menu】　　ENT　　【parameters setting inquiry】

A system control

B fault record

C language selection

D parameters setting inquiry

E password setting

F system autotuning

G data management

H system information

P0 master drive control

P1 speed and deceleration distance

P2 motor parameters

P3 encoder parameters

P4 running comfortability

P5 elevator protection parameters

P6 communication setting

P7 drive information

PE factory only

6.5.1 Parameters setting –master drive control

【main menu】　　ENT　　【parameters setting inquiry】　　ENT　　【P0 master drive control】

A system control

B fault record

C language selection

D parameters setting inquiry

E password setting

F system autotuning

G data management

H system information

P0 master drive control

P1 speed and deceleration distance

P2 motor parameters

P3 encoder parameters

P4 running comfortability

P5 elevator protection parameters

P6 communication setting

P7 drive information

PE factory only

00 speed control mode

01 rated speed of the elevator

02 Max. speed of the elevator

03 Max. output frequency

04 diameter of the tractor

05 deceleration ratio

06 Suspension ratio of the hoisting rope

07 carrier frequency setting

08 running direction selection

Function code	Instruction	Setting range【default value】	Remarks
P0_00	Speed control mode	0-2【1】	Not modify in running

Select the speed control mode of the system.

0: VC without PG, only suitable on the debugging mode of the asynchronous master

1: VC with PG, encoder is needed

2: V/F control, , only suitable on the debugging mode of the asynchronous master

Function code	Instruction	Setting range【default value】	Remarks
P0_01	Rated speed of the elevator	0.100～6.000m/s【1.750】	Not modify in running

Input this parameter according to the name plate of the elevator. This is the basic value of the actual speed of the elevator. Redo hoistway autotuning after modification.

Function code	Instruction	Setting range【default value】	Remarks
P0_02	Max. speed of the elevator	0.100~6.000m/s【1.750】	Not modify in running

This is the upper limit of the actual speed of the elevator.

Function code	Instruction	Setting range【default value】	Remarks
P0_03	Max. output frequency	3.00～400.00Hz【27.8】	Not modify in running

This parameter is used to set the Max. output frequency and the Max. linear speed of the elevator will be limited by this value.

Function code	Instruction	Setting range【default value】	Remarks
P0_07	Carrier frequency setting	1.0～16.0kHz【6.0】	Not modify in running
The advantages of high carrier frequency: optimal current waveform, low current harmonics, low motor noise; Disadvantages of high carrier frequency: increased switching loss, increased inverter temperature rise, affected inverter output capacity, derated operation of the inverter, increased leakage current of the inverter as well as increased electromagnetic interference to the outside. If low carrier frequency is used, the situation will be in contrast with the above. Too low carrier frequency will cause unstable operation at low frequency, lowered torque and even oscillation.			

Function code	Instruction	Setting range【default value】	Remarks
P0_08	Running direction	0-1【0】	Not modify in running
This parameter is used to change the running direction of the master. When the climbing command direction reverses to the actual running command, this parameter can be changed.			

6.5.2 Parameters setting – speed and deceleration distance

【main menu】	【parameters setting inquiry】	【P1 speed and deceleration distance】
A system control	P0 master drive control	00 Increasing acceleration 1
B fault record	P1 speed and deceleration distance	01 Increasing acceleration 2
C language selection	P2 motor parameters	02 Acceleration speed
D parameters setting inquiry	P3 encoder parameters	03 Reducing deceleration 1
E password setting	P4 running comfortability	04 Reducing deceleration 2
F system autotuning	P5 elevator protection parameters	05 Deceleration speed
G data management	P6 communication setting	06 Door area
H system information	P7 drive information	07 Zero-speed threshold
	PE factory only	08 The speed threshold of opening door in advance
		09 Inspection speed
		10 Peristaltic landing speed
		11 UPS running speed
		12 Landing speed
		13 Autotuning speed
		14 Landing precision

Function code	Instruction	Setting range【default value】	Remarks
P1_00	Increasing acceleration 1 (fast acceleration at the beginning stage)	$0.001 \sim 9.999 m/s^3$【0.350】	Not modify in running
P1_01	Increasing acceleration 2 (fast acceleration at the end stage)	$0.001 \sim 9.999 m/s^3$【0.350】	
P1_02	Acceleration speed	$0.001 \sim 9.999 m/s^2$【0.700】	

Function code	Instruction	Setting range【default value】	Remarks
P1_03	Reducing deceleration 1 (fast deceleration at the beginning stage)	$0.001\sim9.999$m/s^3【0.350】	
P1_04	Reducing deceleration 2 (fast deceleration at the beginning stage)	$0.001\sim9.999$m/s^3【0.350】	
P1_05	Deceleration speed	$0.001\sim9.999$m/s^2【0.700】	
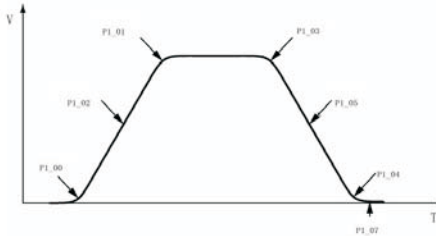
Figure 6-1 Parameters diagram of S curve

Function code	Instruction	Setting range【default value】	Remarks
P1_06	Door area	100~999【200】	Not modify in running

Note	◆ If the total floor≥3, parameter P1_06 can measure the door area (length) by hoistway autotuning. If the total floor≤2, set the value manually. ◆ After hoistway autotuning or save, the value is limited less than 400 automatically.

Function code	Instruction	Setting range【default value】	Remarks
P1_07	Zero-speed threshold	$0\sim0.050$m/s【0】	Not modify in running

Zero-speed threshold means the mini running speed before braking.

Function code	Instruction	Setting range【default value】	Remarks
P1_08	The speed threshold of opening door in advance	$0\sim0.500$m/s【0.050】	Not modify in running

The speed threshold of opening door in advance is the Max. allowed speed when opening the door in advance.

Function code	Instruction	Setting range【default value】	Remarks
P1_09	Inspection speed	0～0.630m/s【0.200】	Not modify in running
P1_10	Peristaltic landing speed	0～0.200m/s【0.03】	
P1_11	UPS running speed	0～1.000m/s【0.100】	
P1_12	Landing speed	0～1.000m/s【0.200】	
P1_13	Autotuning speed	0～1.000m/s【0.100】	
P1_14	Landing precision	0～100mm【50】	

P1.14 is used to adjust the leveling precision. The basic value is 50（50+*）and 50（50-*）.

6.5.3 Parameters setting – motor parameters

【main menu】

A system control

B fault record

C language selection

D parameters setting inquiry

E password setting

F system autotuning

G data management

H system information

ENT →

【parameters setting inquiry】

P0 master drive control

P1 speed and deceleration distance

P2 motor parameters

P3 encoder parameters

P4 running comfortability

P5 elevator protection parameters

P6 communication setting

P7 drive information

PE factory only

ENT →

【P2 motor parameter】

00 Motor type selection

01 Rated power of the motor

02 Rated frequency of the motor

03 Rated speed of the motor

04 Rated voltage of the motor

05 Rated current of the motor

06 Resistance of the stator

07 Resistance of the rotor

08 Inductance of the stator and rotor

09 Mutual inductance of the stator and rotor

10 Current without load

Note	◆ Parameters of P2 will not restore to factory values except the rated power, rated current and rated voltage of the motor.

Function code	Instruction	Setting range【default value】	Remarks
P2_00	Motor type selection	0-1【1】	Not modify in running

Select the motor type

0: Asynchronous master

1: Synchronous master

Note	◆ After changing the motor type, it is necessary to change the encoder type and speed control mode. When the synchronous changes into asynchronous motor, P2_06～P2_10 will match according to the rated power of the motor.

Function code	Instruction	Setting range【default value】	Remarks
P2_01	Rated power of the motor	0.1～150.0kW【7.5】	Not modify in running
P2_02	Rated frequency of the motor	3Hz～400Hz【27.8】	
P2_03	Rated speed of the motor	0～30000rpm【167】	
P2_04	Rated voltage of the motor	0～460V【380】	
P2_05	Rated current of the motor	0.1～1000.0A【15】	

Input above parameters correctly when master autotuning. After modifying the rated power of the asynchronous, P2_06～P2_10 will match according to the rated power of the motor.

Function code	Instruction	Setting range【default value】	Remarks
P2_06	Resistance of the stator	0～65.535Ω【1.41】	Not modify in running

P2_07	Resistance of the rotor	0～65.535Ω【1.41】	
P2_08	Inductance of the stator and rotor	0～6553.5mH【141】	
P2_09	Mutual inductance of the stator and rotor	0～6553.5mH【140】	
P2_10	Current without load	0～655.35A【1.5】	
Above parameters will update automatically after autotuning of the master. These parameters are the basic ones of high performance vector control, having direct impact on the performance control.			

	◆ Do not modify above parameters without permits.

6.5.4 Parameters setting – encoder parameters

【main menu】		【parameters setting inquiry】		【P3 encoder parameters】
A system control		P0 master drive control		00 Encoder type selection
B fault record		P1 speed and deceleration distance		01 Encoder resolution
C language selection		P2 motor parameters		02 Encoder direction
D parameters setting inquiry		P3 encoder parameters		03 Disconnection detection time of the encoder at low speed
E password setting		P4 running comfortability		04 Disconnection detection time of the encoder at high speed
F system autotuning		P5 elevator protection parameters		05 Reverse detection time of the encoder
G data management		P6 communication setting		06 Magnetic pole position amplitude gain
H system information		P7 drive information		07 Magnetic pole position of C phase
		PE factory only		08 Magnetic pole position of D phase
				09 Initial position of the magnetic pole
				10 Static identification current
				11 Pulse counting direction

Note	◆ Parameters of P3 will not restore to factory values.

Function code	Instruction	Setting range 【default value】	Remarks
P3_00	Encoder type selection	0-2 【1】	Not modify in running
Select the encoder type. Generally, the asynchronous master is set to 0 and applying I/O board AJ2 encoder interface. The asynchronous master is set to be 1 and apply main control board CN3 encoder interface. 0: Incremental encoder (Asynchronous master) 1: SIN/COS encoder 2: UVW encoder			

Function code	Instruction	Setting range【default value】	Remarks
P3_01	Encoder resolution	1~10000【2048】	Not modify in running
Set the pulse number of the encoder. The incorrect parameter make the master not work normally.			

Function code	Instruction	Setting range【default value】	Remarks
P3_02	Encoder direction	0-1【0】	Not modify in running
The magnetic position will be changed as the changing of master angle, please modify the parameter.			

Function code	Instruction	Setting range【default value】	Remarks
P3_03	Disconnection detection time of the encoder at low speed	0.0~10.0s【1.0】	Not modify in running
P3_04	Disconnection detection time of the encoder at high speed	0.0~10.0s【1.0】	
P3_05	Reverse detection time of the encoder	0.0~10.0s【1.0】	
Above parameters are the detection time of the encoder fault. Setting 0 can cancel the fault protection. Ensure the braking is open or not when reporting the encoder fault and ensure whether the elevator is sliding when reverse fault occurs to the encoder.			

Function code	Instruction	Setting range【default value】	Remarks
P3_06	Magnetic pole position amplitude gain	0.50~1.50【1.00】	Not modify in running
P3_07	Magnetic pole position of C phase	0~9999【395】	
P3_08	Magnetic pole position of D phase	0~9999【395】	

The setting of above parameters is relative to the static autotuning of synchronous master.

Generally, the magnetic pole position amplitude gain of P3_07 is 0.99. Please set the value between 0.98 and 1.02. Power on after plugging the encoder. Write the sample value of U1.08 C phase and U1.09 D phase in the magnetic pole position of P3_08 C phase and P3_09 D phase to ensure the correction of static autotuning.

Function code	Instruction	Setting range【default value】	Remarks
P3_09	Initial position of the magnetic pole	0.00～360.00【0.00】	Not modify in running
This parameter will update automatically after autotuning. It is the most important parameter of master running and can not be modified.			

Function code	Instruction	Setting range【default value】	Remarks
P3_10	Static identification current	10.0-150.0%【50】	Not modify in running
The reference value of static autotuning. This parameter is used to set the percentage of the identification current to the rated current of the motor. According to the master, it can be set 40%～60%.			

Function code	Instruction	Setting range【default value】	Remarks
P3_11	Pulse counting direction	0:do not change【0】 2:reverse for the synchronous motor 4: reverse for the asynchronous motor	Not modify in running
When the elevator go upstairs, if the height of the floor is decreasing, please change the value of P3_11.			

Note	◆ Please judge the counting direction when hoistway autotuning. The real-time height of the elevator will increase when the elevator is raising.

6.5.5 Parameters setting –running comfortability

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【P4 running comfortability】
A system control		P0 master drive control		00 ASR low speed proportion gain
B fault record		P1 speed and deceleration distance		01 ASR low speed integral time
C language selection		P2 motor parameters		02 Speed detection low speed filtrate times
D parameters setting inquiry		P3 encoder parameters		03 Switch low point frequency
E password setting		P4 running comfortability		04 ASR high speed proportion gain
F system autotuning		P5 elevator protection parameters		05 ASR high speed integral time
G data management		P6 communication setting		06 Speed detection high speed filtrate times
H system information		P7 drive information		07 Switch high point frequency
		PE factory only		08 ACR proportional gain P
				09 ACR integral gain I
				10 Current loop filter coefficient
				11 Slip compensation rate of drive side
				12 Slip compensation rate of braking side
				13 Torque upper limit
				14 Load compensation enabling
				15 Load compensation time

		16 Reducing time of load compensation
		17 ASR proportional gain
		18 ASR integral time
		19 APR proportional gain
		20 APR integral time
		21 Current compensation coefficient
		22 Rated load
		23 Weighing input selection
		24 Weighing compensation input channel
		25 Pre-torque bias
		26 Bias and gain at the braking side
		27 Bias and gain at the drive side
		28 Analog input filter of car weighting
		29 Analog input filter of engine room
		30 Smooth filter time of the curve

Function code	Instruction	Setting range【default value】	Remarks
P4_00	ASR low speed proportion gain	0～100【20】	Not modify in running
P4_01	ASR low speed integral time	0.01～10.00s【0.50】	
P4_02	Speed detection low speed filtrate times	0～8【0】	
P4_03	Switch low point frequency	0.00Hz～10.00Hz【2.00】	
P4_04	ASR high speed proportion gain	0～100【20】	

P4_05	ASR high speed integral time	0.01～10.00s【0.60】
P4_06	Speed detection high speed filtrate times	0～8【0】
P4_07	Switch high point frequency	0～400【5.00】

The above parameters are only valid for vector control. When under the low point switch frequency (P4_03), speed loop parameter PI is P4_00 and P4_01, when over the high low point switch frequency (P4_07), speed loop parameter PI is P4_04 and P4_05. Please refer to following figure for details.
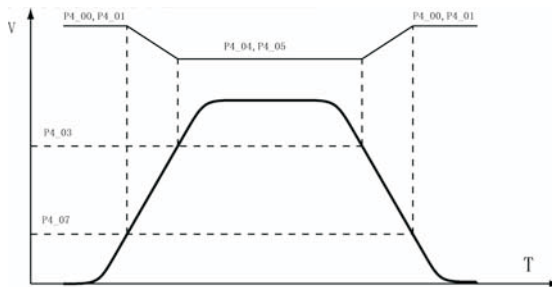

Figure 6-2 Parameters of speed loop PI

The system's dynamic response can be faster if the proportion gain KBpB is increased or the integral time KBiB is decreased; however, if KBpB is too large or KBiB is too small, the system becomes overshoot and tends to oscillate. If KBpB is too small, may cause the system steady-state-oscillation, and maybe the speed static will occur.

Speed loop parameter PI has strong relationship with the system's inertia, in order to meet the requirement of any situation; the PI should be adjusted based on the default set when the load of the system changed.

P4_02 and P4_06 are filter times of motor speed detection which need not to be adjusted, increase the values if there is current noise when motor is running.

Function code	Instruction	Setting range【default value】	Remarks
P4_08	ACR proportional gain P	0～65535【2000】	Not modify
P4_09	ACR integral gain I	0～65535【1000】	in running

Note: The above parameters are related to the ACR adjustment, which directly affects the dynamic response and control accuracy if the system. Generally, the user can not modify the value.

Note	◆	Incorrect parameters will make vibration to the system.

Function code	Instruction	Setting range【default value】	Remarks
P4_10	Current loop filter coefficient	0-65535【3】	Not modify in running

This parameter is used to set the current loop filter times in the whole running.

Function code	Instruction	Setting range【default value】	Remarks
P4_11	Slip compensation rate of drive side	50～200%【100】	Not modify in running
P4_12	Slip compensation rate of braking side	50～200%【100】	

The parameter is used to adjust the slip frequency of vector control and improve the precision of speed control. Properly adjusting this parameter can effectively restrain the steady-state error.

Function code	Instruction	Setting range【default value】	Remarks
P4_13	Torque upper limit	0.0~200.0% (rated current)【150.0】	Not modify in running

100.0% corresponds with the rated current of inverter.

Function code	Instruction	Setting range【default value】	Remarks
P4_14	Load compensation enabling	0～1【1】	Not modify in running
P4_15	Load compensation time	0.000～5.000s【0.700】	

P4_16	Reducing time of load compensation	0.000～5.000s【0.300】	
P4_17	ASR proportional gain	0～100【30】	
P4_18	ASR integral time	0.01～10.00s【0.16】	
P4_19	APR proportional gain	0～100【0】	
P4_20	APR integral time	0.01～10.00s【0.01】	
P4_21	Current compensation coefficient	-1000～4000【1500】	

Above parameters are used to set the non-weighting compensation function.

Note	Only when set P4_14 to be 1 to enable the non-weighting compensation function, P4_15, P4_16, P4_17, P4_18, P4_19, P4_20, P4_21 are valid. And P4_17, P4_18, P4_19, P4_20 and P4_21 are valid in the time set by P4_15.

Function code	Instruction	Setting range【default value】	Remarks
P4_22	Rated load (rated load of the elevator)	0～10000kG【1000】	Not modify in running
P4_23	Weighing input selection	0～2【0】	

P4_23: Weighting input selection

Set the signal input of LL, FL and OL.

0: Light load, full load and overload correspond to LL, FL and OL.

1: Select the analog input of the car. Install analog weighting sensor of DC0～10V and set after weighting autotuning.

2: Select the analog input of the engine room. Install analog weighting sensor of DC0～10V and set after weighting autotuning.

Function code	Instruction	Setting range【default value】	Remarks
P4_24	Weighting compensation input channel	0-2【0】	Not modify in

Function code	Instruction	Setting range【default value】	Remarks
P4_25	Pre-torque bias	0.0～100.0%【45】	running
P4_26	Bias and gain at the braking side	0.000～5.000【2.000】	
P4_27	Bias and gain at the drive side	0.000～5.000【2.000】	

The parameter is used to set the weighing compensation input channel.

0: no compensation

1: CAN communication. Install analog weighting sensor in the bottom of the car. Send the load signal to the main board after autotuning.

2: terminal input. Need analog weighting signal of DC0～10V output

P4_25 can improve the comfortability when starting. Usually set to the balance coefficient of the elevator.

When the drive is in the power generation state, adjust P4_26.

When the drive is in the motoring state, adjust P4_27.

Note	◆ P4_25, P4_26 and P4_27 are only valid when set P4_24 to be non-zero.

Function code	Instruction	Setting range【default value】	Remarks
P4_28	Analog input filter of car weighting	0.00~0.50s【0.1】	Not modify in running
P4_29	Analog input filter of engine room	0.00~0.50s【0.1】	
P4_30	Smooth filter time of the curve	0~20ms【6】	

6.5.6 Parameters setting – elevator protection parameters

【main menu】		【parameters setting		【P5 Elevator
A system control		inquiry】		protection parameters】
B fault record		P0 master drive		00 Input phase loss
C language selection		control		protection
D parameters setting		P1 speed and		01 Output phase loss
inquiry		deceleration distance		protection
E password setting		P2 motor parameters		02 Motor overload
F system autotuning		P3 encoder		protection
G data management		parameters		03 Motor overload
H system information		P4 running		protection current
		comfortability		04 Overload
		P5 elevator protection		pre-warning threshold
		parameters		05 Overload
		P6 communication		pre-warning selection
		setting		06 Overload
		P7 drive information		pre-warning delay time
		PE factory only		07 Automatic fault reset
				times
				08 Fault reset interval
				09 Threshold of over
				speed deviation
				10 Detection time of
				over speed deviation
				11 Braking threshold
				voltage

Function code	Instruction	Setting range【default value】	Remarks
P5_00	Input phase loss protection	0-2【0】	Not modify in running
P5_01	Output phase loss protection	0-1【1】	

Above function codes select input/output phase loss protection enabling.

0: Prohibit

1: Enabling

2: Only enabling in running

Function code	Instruction	Setting range【default value】	Remarks
P5_02	Motor overload protection	0-2【2】	Not modify in running
0: Disabled 1: Normal motor. For normal motor (within the function of low speed compensation), the lower the speed, the poorer the cooling effect. Based on this reason, if output frequency is lower than 30Hz, inverter will reduce the motor overload protection threshold to prevent normal motor from overheat. 2: Variable frequency motor. For variable frequency motor (without the function of low speed compensation),As the cooling effect of variable frequency motor has nothing to do with running speed, it is not required to adjust the motor overload protection threshold.			

Function code	Instruction	Setting range【default value】	Remarks
P5_03	Motor overload protection current	20.0%～120.0%(rated current of the motor)【100.0】	Not modify in running
Motor overload protection current = (motor rated current / machine rated current) * 100%			

Note	◆ This parameter is normally used when rated power of the machine is greater than rated power of motor.

Function code	Instruction	Setting range【default value】	Remarks
P5_04	Overload pre-warning threshold	20.0%～150.0%【130.0】	Not modify in running

P5_05	Overload pre-warning selection	0-3【0】	
P5_06	Overload pre-warning delay time	0.0～30.0s【5.0】	

The value of P5_04 determines the pre-warning threshold, 100% corresponds to the rated current of the machine.

P5_05: Overload pre-warning selection, determine the overload type.

0: corresponds to the rated current of the motor, detecting

1: corresponds to the rated current of the motor, detecting when constant speed

2: corresponds to the rated current of the machine, detecting

3: corresponds to the rated current of the machine, detecting when constant speed

When the output current is more than the pre-warning threshold, the system will report fault.

Function code	Instruction	Setting range【default value】	Remarks
P5_07	Automatic fault reset times	0～10【3】	Not modify in running
P5_08	Fault reset interval	0.1～100.0s【10.0】	

When P5_07 is set to non-zero, the drive fault is allowed to reset after the interval time set by P5_08, when the time is more than, the system will stop and need to reset after powering off.

Function code	Instruction	Setting range【default value】	Remarks
P5_09	Threshold of over speed deviation	0.1%～50.0%【20.0】	Not modify in running
P5_10	Detection time of over speed deviation	0.000～10.000s【0.500】	
P5_11	Braking threshold voltage	320～750【700】	

Note	The speed detection is set to the rated speed of the elevator, pulley diameter and gear ratio.

6.5.7 Parameters setting – communication setting

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【P6 Communication setting】
A system control		P0 master drive control		00 Local communication address
B fault record		P1 speed and deceleration distance		01 Communication baud rate selection
C language selection		P2 motor parameters		02 Data format
D parameters setting inquiry		P3 encoder parameters		03 Communication response enabling
E password setting		P4 running comfortability		04 Communication response delay
F system autotuning		P5 elevator protection parameters		05 Communication timeout fault
G data management		**P6 communication setting**		06 reserved
H system information		P7 drive information		07 reserved
		PE factory only		08 Communication speed setting of Ethernet
				09 IP address of Ethernet 1
				10 IP address of Ethernet 2
				11 IP address of Ethernet 3
				12 IP address of Ethernet 4
				13 Set the subnet mask 1
				14 Set the subnet mask 2
				15 Set the subnet mask 3
				16 Set the subnet mask 4

Function code	Instruction	Setting range【default value】	Remarks
P6_00	Local communication address	1-247【1】	Not modify in running
When the master is writing the frame, if the communication address of the slave is set to be 0 (that is the broadcast communication address), all slaves on the MODBUS bus will receive the frame, but the slaves will not make any response. The local communication address is a unique address in the communication network. This is the basis for point-to-point communications between the upper computer and the inverter.			

Function code	Instruction	Setting range【default value】	Remarks
P6_01	Communication baud rate selection	0-5【4】	Not modify in running

This parameter is used to set the data transmission rate between the upper computer and the machine
    0：1200BPS
    1：2400BPS
    2：4800BPS
    3：9600BPS
    4：19200BPS
    5：38400BPS			

Note	The baud rate setting of the upper computer should be the same as that of the machine. Otherwise, communications cannot be implemented. The higher the baud rate, the faster the communication speed is.

Function code	Instruction	Setting range【default value】	Remarks
P6_02	Data format	0-2【1】	Not modify in running

The data format setting of the upper computer should be the same as that of the machine. Otherwise, communications cannot be implemented.

0: No parity（N，8，1）for RTU

1: Even parity（E，8，1）for RTU

2: Odd parity（O，8，1）for RTU

Function code	Instruction	Setting range【default value】	Remarks
P6_03	Communication response enabling	0-1【0】	Not modify in running
0: enabled 1: disabled			

Function code	Instruction	Setting range【default value】	Remarks
P6_04	Communication response delay	0-20ms【0】	Not modify in running
Reply delay: refers to the interval time between the end of data receiving of the machine and the reply data sending of the upper computer. If the reply delay time is less than the system processing time, take the system processing time as reply delay reference. If the reply delay is longer than the system processing time, after data processing, the system has to wait until the reply delay time is reached before sending data to the upper computer.			

Function code	Instruction	Setting range【default value】	Remarks
P6_05	Communication timeout fault	0-100.0s【0】	Not modify in running

If the functional code is set to 0.0s, the communication delay time parameter is disabled.

When the functional code is set to be a valid value, if the interval between the current communication and the next communication exceeds the communication delay time, the system will send a communication fault error (Err18).

Normally, it is set to be "disabled". If this parameter is set in a consecutive communication system, communication state can be monitored.

Function code	Instruction	Setting range【default value】	Remarks
P6_08	Communication speed setting of Ethernet	0-4【0】	Not modify in running
0: 10M full duplex 1: 10M semi duplex 2: 100M full duplex 3: 100M semi duplex 4: Self-adaptation			

Function code	Instruction	Setting range【default value】	Remarks
P6_09~ P6_12	IP address of Ethernet	0-255【192】 0-255【168】 0-255【5】 0-255【60】	Not modify in running
Set the IP address of Ethernet. IP address: P6.09.P6.10.P6.11.P6.12 For example: IP address is 192.168.5.60			

Function code	Instruction	Setting range【default value】	Remarks
P6_13~ P6_16	Set the subnet mask	0-255【255】 0-255【255】 0-255【254】 0-255【0】	Not modify in running

Set the subnet mask of the Ethernet.

The format of IP subnet mask format: P6.13.P6.14.P6.15.P6.16.

For example: the subnet mask is 255.255.254.0.

6.5.8 Parameters setting—drive information

【main menu】		【parameters setting inquiry】		【P7 Drive information】
A system control	ENT	P0 master drive control	ENT	00 year setting
B fault record		P1 speed and deceleration distance		01 month/date setting
C language selection		P2 motor parameters		02 hour/minute setting
D parameters setting inquiry		P3 encoder parameters		03 Rectifier temperature
E password setting		P4 running comfortability		04 Inverter module temperature
F system autotuning		P5 elevator protection parameters		05 DSP software version
G data management		P6 communication setting		06 MCU software version
H system information		P7 drive information		07 FPGA software version
		PE factory only		08 software version of the car board
				09 software version of the group control board
				10 running time displaying
				11 rated power displaying
				12 rated current displaying

6.5.9 Parameters setting—floor setting

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【A1 floor setting】
A system control		P0 master drive control		**00 Collective selective control mode**
B fault record		P1 speed and deceleration distance		01 total floor setting
C language selection		P2 motor parameters		02 Basement setting
D parameters setting inquiry		P3 encoder parameters		03 Fire landing setting
E password setting		P4 running comfortability		04 Park floor
F system autotuning		P5 elevator protection parameters		05 Base floor setting
G data management		P6 communication setting		06 door local detection
H system information		P7 drive information		
		PE factory only		
		A1 floor setting		
		A2 floor displaying		
		H0 logic of the IO control board		
		H1 logic of the car control board		
		H2 front door stopping floor		
		H3 rear door stopping floor		
		H4 front/ rear door stopping floor		
		L0 parallel and group control setting		

Function code	Instruction	Setting range【default value】	Remarks
A1_00	Collective selective control mode	0-2【0】	Not modify in running
Select the calling control mode.			
0: full selective;			
1: reserved;			
2: XPM (the elevator closes when holding close button in attendant state and it opens after releasing the button, generally for goods elevator);			

Function code	Instruction	Setting range【default value】	Remarks
A1_01	Total floor setting	2～64【16】	Not modify in running
A1_02	Basement setting	0～10【0】	
A1_03	Fire landing setting	1～64【1】	
A1_04	Park floor	1～64【1】	
A1_05	Base floor setting	1～64【1】	
Above parameters are corresponding floor setting			

6.5.10 Parameters setting—floor displaying setting

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【A2 Floor displaying】
A system control		P0 master drive control		1 floor displaying
B fault record		P1 speed and deceleration distance		2 floor displaying
C language selection		P2 motor parameters		3 floor displaying
D parameters setting inquiry		P3 encoder parameters		4 floor displaying
E password setting		P4 running comfortability		5 floor displaying
F system autotuning		P5 elevator protection parameters		6 floor displaying
G data management		P6 communication setting		7 floor displaying
H system information		P7 drive information		8 floor displaying
		PE factory only		9 floor displaying
		A1 floor setting		.
		A2 floor displaying		.
		H0 logic of the IO control board		.
		H1 logic of the car control board		64 floor displaying
		H2 front door stopping floor		
		H3 rear door stopping floor		
		H4 front/ rear door stopping floor		
		L0 parallel and group control setting		

Function code	Instruction	Setting range 【default value】	Remarks
A2_00	1 floor displaying	0～9090【1617】	Not
A2_01	2 floor displaying	0～9090【1618】	modify in
A2_02	3 floor displaying	0～9090【1619】	running
A2_03	4 floor displaying	0～9090【1620】	
A2_04	5 floor displaying	0～9090【1621】	
A2_05	6 floor displaying	0～9090【1622】	
A2_06	7 floor displaying	0～9090【1623】	
A2_07	8 floor displaying	0～9090【1624】	
A2_08	9 floor displaying	0～9090【1625】	
A2_09	10 floor displaying	0～9090【1716】	
A2_10	11 floor displaying	0～9090【1717】	
A2_11	12 floor displaying	0～9090【1718】	
A2_12	13 floor displaying	0～9090【1719】	
A2_13	14 floor displaying	0～9090【1720】	
A2_14	15 floor displaying	0～9090【1721】	
A2_15	16 floor displaying	0～9090【1722】	
A2_16	17 floor displaying	0～9090【1723】	
A2_17	18 floor displaying	0～9090【1724】	
A2_18	19 floor displaying	0～9090【1725】	
A2_19	20 floor displaying	0～9090【1816】	
A2_20	21 floor displaying	0～9090【1817】	
A2_21	22 floor displaying	0～9090【1818】	
A2_22	23 floor displaying	0～9090【1819】	
A2_23	24 floor displaying	0～9090【1820】	
A2_24	25 floor displaying	0～9090【1821】	
A2_25	26 floor displaying	0～9090【1822】	
A2_26	27 floor displaying	0～9090【1823】	
A2_27	28 floor displaying	0～9090【1824】	
A2_28	29 floor displaying	0～9090【1825】	
A2_29	30 floor displaying	0～9090【1916】	
A2_30	31 floor displaying	0～9090【1917】	

Function code	Instruction	Setting range【default value】	Remarks
A2_31	32 floor displaying	0～9090【1918】	
A2_32	33 floor displaying	0～9090【1919】	
A2_33	34 floor displaying	0～9090【1920】	
A2_34	35 floor displaying	0～9090【1921】	
A2_35	36 floor displaying	0～9090【1922】	
A2_36	37 floor displaying	0～9090【1923】	
A2_37	38 floor displaying	0～9090【1924】	
A2_38	39 floor displaying	0～9090【1925】	
A2_39	40 floor displaying	0～9090【2016】	
A2_40	41 floor displaying	0～9090【2017】	
A2_41	42 floor displaying	0～9090【2018】	
A2_42	43 floor displaying	0～9090【2019】	
A2_43	44 floor displaying	0～9090【2020】	
A2_44	45 floor displaying	0～9090【2021】	
A2_45	46 floor displaying	0～9090【2022】	
A2_46	47 floor displaying	0～9090【2023】	
A2_47	48 floor displaying	0～9090【2024】	
A2_48	49 floor displaying	0～9090【2025】	
A2_49	50 floor displaying	0～9090【2116】	
A2_50	51 floor displaying	0～9090【2117】	
A2_51	52 floor displaying	0～9090【2118】	
A2_52	53 floor displaying	0～9090【2119】	
A2_53	54 floor displaying	0～9090【2120】	
A2_54	55 floor displaying	0～9090【2121】	
A2_55	56 floor displaying	0～9090【2122】	
A2_56	57 floor displaying	0～9090【2123】	
A2_57	58 floor displaying	0～9090【2124】	
A2_58	59 floor displaying	0～9090【2125】	
A2_59	60 floor displaying	0～9090【2216】	
A2_60	61 floor displaying	0～9090【2217】	
A2_61	62 floor displaying	0～9090【2218】	
A2_62	63 floor displaying	0～9090【2219】	

Function code	Instruction	Setting range【default value】	Remarks
A2_63	64 floor displaying	0～9090【2220】	

Setting value	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Displaying		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
Setting value	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Displaying	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Setting value	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Displaying	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Setting value	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Displaying	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Setting value	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Displaying	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Setting value	80	81	82	83	84	85	86	87	88	89	90	Floor displaying Corresponding table				
Displaying	p	q	r	s	t	u	v	w	x	y	z					

6.5.11 Parameters setting—I/O control board logic setting

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【H0 logic of the IO control board】
A system control		P0 master drive control		00 logic setting 1
B fault record		P1 speed and deceleration distance		01 logic setting 2
C language selection		P2 motor parameters		02 logic setting 3
D parameters setting inquiry		P3 encoder parameters		03 logic setting 4
E password setting		P4 running comfortability		04 logic setting 5
F system autotuning		P5 elevator protection parameters		05 logic setting 6
G data management		P6 communication setting		06 I/O control board logic setting
H system information		P7 drive information		07 reserved
		PE factory only		08 reserved
		A1 floor setting		
		A2 floor displaying		
		H0 logic of the IO control board		
		H1 logic of the car control board		
		H2 front door stopping floor		
		H3 rear door stopping floor		
		H4 front/ rear door stopping floor		
		L0 parallel and group control setting		

Logic setting 1 is the logic setting of the following signals:

Terminal	P8	P7	P6	P5	P4	P3	P2	P1
Definition	Up limit	Down limit	High speed up forced deceleration signal	High speed down forced deceleration signal	Medium speed up forced deceleration signal	Medium speed down forced deceleration signal	LOW speed up forced deceleration signal	LOW speed down forced deceleration signal
NO/NC	●	●	●	●	●	●	●	●
Binary	1	1	1	1	1	1	1	1
Decimal	1×128	1×64	1×32	1×16	1×8	1×4	1×2	1×1
H0_00 Logic setting 1	128+64+32+16+8+4+2+1=255							

1 to 8 (form low bit to high bit) are shown in binary numbers. The corresponding bit of NO points set to be 0 and the NC to be 1. Write the convertering decimal result to logic 1.

Above switches are NC, which can be shown in binary 11111111, converted into decimal （1+2+4+8+16+32+64+128）=255.

Logic setting 2 is the logic setting of the following signals:

Terminal	P16	P15	P14	P13	P12	P11	P10	P9
Definition	Safety contactor detection	Middle door area	Down door area	Up door area	Inspection down signal	Inspection up signal	Inspection signal	Emergency electrical action
NO/NC	○	○	○	○	○	○	●	●
Binary	0	0	0	0	0	0	1	1
Decimal	0×128	0×64	0×32	0×16	0×8	0×4	2×2	1×1
H0_01 Logic setting 2	2+1=3							

9 to 16 (form low bit to high bit) are shown in binary numbers. The corresponding bit of NO points set to be 0 and the NC to be 1. Write the convertering decimal result to logic 2.

Above switches 9 and 10 are NC, and others are NO, which can be shown in binary 00000011, converted into decimal （1+2）=003.

Logic setting 3 is the logic setting of the following signals:

Terminal	P24	P23	P22	P21	P20	P19	P18	P17
Definition	Safety high- voltage detection	UPS input signal	Fire action signal	Motor thermal protection	Braking travel switch detection	Braking contactor detection	Drive output contactor detection	Door lock contactor detection
NO/NC	○	○	○	○	●	●	●	○
Binary	0	0	0	0	1	1	1	0
Decimal	0×128	0×64	0×32	0×16	1×8	1×4	1×2	0×1
H0_02 Logic setting 3	8+4+2=14							

17 to 24 (form low bit to high bit) are shown in binary numbers. The corresponding bit of NO points set to be 0 and the NC to be 1. Write the convertering decimal result to logic 3.
Above switches 18-20 are NC, and others are NO, which can be shown in binary 00001110, converted into decimal（2+4+8）=014.

Logic setting 4 is the logic setting of the following signals:

Terminal	P32	P31	P30	P29	P28	P27	P26	P25
Definition	Self-definiti on input 3	Self-definiti on input 2	Self-definiti on input 1	Advanced opening adhesion	Advanced opening feedback	Hardware enabling	Hall door lock high voltage detection	Car door lock high voltage detection
NO/NC	○	○	○	○	○	○	○	○
Binary	0	0	0	0	0	0	0	0
Decimal	0×128	0×64	0×32	0×16	0×8	0×4	0×2	0×1
H0_03 Logic setting 4	0							

25 to 32 (form low bit to high bit) are shown in binary numbers. The corresponding bit of NO points set to be 0 and the NC to be 1. Write the convertering decimal result to logic 1.

Above input are NO, which can be shown in binary 00000000，converted into decimal 000.
The single logic setting of I/O board is the logic setting of each point on I/O board. It can be
modified associated with logic setting 1-6:

【H0 IO I/O control board logic setting】	【input signal 1-32：】	1 low speed down forced speed changing I/O input signal logic setting
00 logic setting 1	1 low speed down forced speed changing	
01 logic setting 2		
02 logic setting 3	2 low speed down forced speed changing	Current value: 1
03 logic setting 4		Setting: 1
04 logic setting 5	3 low speed down forced speed changing	
05 logic setting 6		
06 I/O control board logic setting	4 low speed down forced speed changing	【parameters instruction】
07 reserved		0: NO
08 reserved		1: NC
	5 low speed down forced speed changing	
	6 low speed down forced speed changing	
	7 down limit	
	8 up limit	
	9 emergency-motion	

6.5.12 Parameters setting—setting of control board in car

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【H1 logic of the car control board】
A system control		P0 master drive control		00 car logic setting 1
B fault record		P1 speed and deceleration distance		01 car logic setting 2
C language selection		P2 motor parameters		02 car logic setting 3
D parameters setting inquiry		P3 encoder parameters		03 car logic setting 4
E password setting		P4 running comfortability		04 single logic setting of the car
F system autotuning		P5 elevator protection parameters		05 reserved
G data management		P6 communication setting		06 reserved
H system information		P7 drive information		07 reserved
		PE factory only		08 reserved
		A1 floor setting		
		A2 floor displaying		
		H0 logic of the IO control board		
		H1 logic of the car control board		
		H2 front door stopping floor		
		H3 rear door stopping floor		
		H4 front/ rear door stopping floor		
		L0 parallel and group control setting		

Logic setting 1 is the logic setting of below signal points:

Terminal	C8	C7	C6	C5	C4	C3	C2	C1
Definition	Safety edge	Closing input	Opening input signal	Door close d	Door open	OL	DD	Attendant

		signal							
NO/NC	●	○	○	●	●	○	○	○
Binary	1	0	0	1	1	0	0	0
Decimal	1×128	0×64	0×32	1×16	1×8	0×4	0×2	0×1
H1_00 Logic setting 1	128+16+8=152							

Input point 1 to 8 (form low bit to high bit) are shown in binary numbers. The corresponding bit of NO points set to be 0 and the NC to be 1. Write the convertering decimal result to logic 1.

The parameter is set to 004 if the OL switch is NC.

The parameter is set to (16+8)=24 if the Door closed/open is NC.

The parameter is set to 128 if the front door beam is NC.

The parameter is set to (128+16+8)=152 if the OL, Door closed/open and beam are NC and others are NO.

Logic setting 2 is the logic setting of below signal points:

Terminal	C16	C15	C14	C13	C12	C11	C10	C9
Definition	Closing button for fire fighters	Rear door closed	Rear door open	Independent running	Front/rear door switching	Beam	Full load	Light load
NO/NV	○	○	○	○	○	○	○	○
Binary	0	0	0	0	0	0	0	0
Decimal	0×128	0×64	0×32	0×16	0×8	0×4	0×2	0×1
H1_01 Logic setting 2	0							

The single logic setting of car is the logic setting of each point of main controller in car. It can be modified associated with logic setting 1-4:

【H1 setting of control board in car】 ☞ ENT 【input signal1-32：】 ☞ ENT 1 Attendant

【H1 setting of control
board in car】
00 car logic setting 1
01 car logic setting 2
02 car logic setting 3
03 car logic setting 4
04 single logic setting of the car
05 reserved
06 reserved
07 reserved
08 reserved

【input signal1-32：】
1 Attendant
2 DD
3 OL
4 door open
5 door closed
6 opening button
7 closing button
8 safety trigger
9 LL

1 Attendant
Logic setting of the car input signal

Current value: 1
Setting: 1

【 parameters instruction】
0: NO
1: NC

6.5.13 Parameters setting – front door stopping floor

【main menu】 ☞ ENT 【parameters setting inquiry】 ☞ ENT 【H2 front door stopping floor】

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

【parameters setting inquiry】
P0 master drive control
P1 speed and deceleration distance
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only
A1 floor setting
A2 floor displaying
H0 logic of the IO control board
H1 logic of the car

【H2 front door stopping floor】
00 front door stopping floor enabling 1
01 front door stopping floor enabling 2
02 front door stopping floor enabling 3
03 front door stopping floor enabling 4
04 front door stopping floor enabling 5
05 front door stopping floor enabling 6
06 front door stopping floor enabling 7
07 front door stopping floor enabling 8
08 set opening at stop according to floors

control board

H2 front door stopping floor

H3 rear door stopping floor

H4 front/ rear door stopping floor

L0 parallel and group control setting

Function code	Instruction	Setting range 【default value】	Remarks
H2_00	Front door 1～8 floor	000～255【255】	Not modify in running
H2_01	Front door 9～16 floor	000～255【255】	
H2_02	Front door 17～24 floor	000～255【255】	
H2_03	Front door 25～32 floor	000～255【255】	
H2_04	Front door 33～40 floor	000～255【255】	
H2_05	Front door 41～48 floor	000～255【255】	
H2_06	Front door 49～56 floor	000～255【255】	
H2_07	Front door 57～64 floor	000～255【255】	
H2_08	Reserved		

Set the front door stopping floor which is shown by binary numbers.

1: valid

0: invalid

For example, if the elevator stops at 1, 3, 6, and 8 floor and does not stop at other

floors. Then H2_00=（1+4+32+128）=165. see the figure below for detailed calculation:

【H2_00 1-8 stopping floor】	NO	NC	【H2_00 1-8 stopping floor】	NO	NC
1floor	0	1	5 floor	0	16
2 floor	0	2	6 floor	0	32
3 floor	0	4	7 floor	0	64
4 floor	0	8	8 floor	0	128

The menu and method for setting closing/opening of the elevator:

【H2 stopping floor of front door】	【Closing/Opening enabling】	01 floor closing/opening enabling
00 stopping floor of front door enabling 1	01 floor closing/opening enabling	Current value: 01
01 stopping floor of front door enabling 2	02 floor closing/opening enabling	Setting: 01
02 stopping floor of front door enabling 3	03 floor closing/opening enabling	[Instruction of parameters]
03 stopping floor of front door enabling 4	……	0: Not stop
04 stopping floor of front door enabling 5	61 floor closing/opening enabling	1: Open the front door
05 stopping floor of front door enabling 6	62 floor closing/opening enabling	2: Open the rear door
06 stopping floor of front door enabling 7	63 floor closing/opening enabling	3: Calling decides to close/open the door
07 stopping floor of front door enabling 8		7: The front and rear doors close/open simultaneously.
08 Set opening at stop according to floors		

After entering the menu, set the doors of 1~63 floors respectively. Set the parameter to 0 for passing without stop, 1 for opening the front door, 2 for opening the rear door, 3 for opening the door according to calling of front and rear doors or calling signals of control box, and 7 for closing/opening the front and rear doors simultaneously.

6.5.14 Parameters setting – rear door stopping floor

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【H3 rear door stopping floor】
A system control		P0 master drive control		00 rear door stopping floor enabling 1
B fault record		P1 speed and deceleration distance		01 rear door stopping floor enabling 2
C language selection		P2 motor parameters		02 rear door stopping floor enabling 3
D parameters setting inquiry		P3 encoder parameters		03 rear door stopping floor enabling 4
E password setting		P4 running comfortability		04 rear door stopping floor enabling 5
F system autotuning		P5 elevator protection parameters		05 rear door stopping floor enabling 6
G data management		P6 communication setting		06 rear door stopping floor enabling 7
H system information		P7 drive information		07 rear door stopping floor enabling 8
		PE factory only		08 reserved
		A1 floor setting		
		A2 floor displaying		
		H0 logic of the IO control board		
		H1 logic of the car control board		
		H2 front door stopping floor		
		H3 rear door stopping floor		
		H4 front/ rear door stopping floor		
		L0 parallel and group control setting		

Function code	Instruction	Setting range 【default value】	Remarks
H3_00	Rear door 1～8 floor	000～255【0】	
H3_01	Rear door 9～16 floor	000～255【0】	
H3_02	Rear door 17～24 floor	000～255【0】	
H3_03	Rear door 25～32 floor	000～255【0】	Not modify in running
H3_04	Rear door 33～40 floor	000～255【0】	
H3_05	Rear door 41～48 floor	000～255【0】	
H3_06	Rear door 49～56 floor	000～255【0】	
H3_07	Rear door 57～64 floor	000～255【0】	
H3_08	Reserved		
Set the rear door stopping floor with the same method mentioned above.			

6.5.15 Parameters setting –front/rear door stopping floor

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

☞ ENT

【parameters setting inquiry】
P0 master drive control
P1 speed and deceleration distance
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only
A1 floor setting
A2 floor displaying
H0 logic of the IO control board

☞ ENT

【H4 front/rear door stopping floor】
00 front/rear door stopping floor enabling1
01 front/rear door stopping floor enabling2
02 front/rear door stopping floor enabling3
03 front/rear door stopping floor enabling4
04 front/rear door stopping floor enabling5
05 front/rear door stopping floor enabling6
06 front/rear door stopping floor enabling7
07 front/rear door stopping floor enabling8
08 reserved

H1 logic of the car
control board
H2 front door stopping
floor
H3 rear door stopping
floor
H4 front/ rear door
stopping floor
L0 parallel and group
control setting

Function code	Instruction	Setting range 【default value】	Remarks
H4_00	Front/rear door 1～8 floor	000～255【0】	Not modify in running
H4_01	Front/rear door 9～16 floor	000～255【0】	
H4_02	Front/rear door 17～24 floor	000～255【0】	
H4_03	Front/rear door 25～32 floor	000～255【0】	
H4_04	Front/rear door 33～40 floor	000～255【0】	
H4_05	Front/rear door 41～48 floor	000～255【0】	
H4_06	Front/rear door 49～56 floor	000～255【0】	
H4_07	Front/rear door 57～64 floor	000～255【0】	
H4_08	Reserved		
Set the front/rear door stopping floor with the same method mentioned above.			

6.5.16 Parameters setting – parallel and group control setting

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【L0 parallel and group control setting】
A system control		P0 master drive control		00 Group number of the elevator
B fault record		P1 speed and deceleration distance		01 Up bias floor
C language selection		P2 motor parameters		02 Down bias floor
D parameters setting inquiry		P3 encoder parameters		03 Parallel home floor
E password setting		P4 running comfortability		
F system autotuning		P5 elevator protection parameters		
G data management		P6 communication setting		
H system information		P7 drive information		
		PE factory only		
		A1 floor setting		
		A2 floor displaying		
		H0 logic of the IO control board		
		H1 logic of the car control board		
		H2 front door stopping floor		
		H3 rear door stopping floor		
		H4 front/ rear door stopping floor		
		L0 parallel and group control setting		

Function code	Instruction	Setting range 【default value】	Remarks
L0_00	Group number of the elevator	0～10【0】	Not modify in running
L0_01	Up bias floor	0～64【0】	
L0_02	Down bias floor	0～64【0】	
L0_03	Parallel home floor	0～64【0】	
Set the parallel or group control parameters. L0_00: 0: single elevator 1: parallel main elevator 2: parallel sub elevator 3 and above: group control L0_01, L0_02 and L0_03 are needed in the parallel applications.			

Note	◆ When there is only up bias for parallel elevators, set the up bias to main elevator and pass the floors above the top floor of sub elevator without stop. ◆ When there is only down bias for parallel elevators, set the down bias to main elevator. Simultaneously, if there is up bias, set the top floor or above of lower floors to non-stop.

6.5.17 Parameters setting – time setting

【main menu】	ENT	【parameters setting inquiry】	ENT	【T0 time setting】
A system control		P0 master drive control		00 Open delay
B fault record		P1 speed and deceleration distance		01 Return to the home floor delay
C language selection		P2 motor parameters		02 Free emergency-saving delay
D parameters setting inquiry		P3 encoder parameters		03 Brake opening delay
E password setting		P4 running comfortability		04 Brake closing delay
F system autotuning		P5 elevator protection parameters		05 Starting shake prevention delay
G data management				06 Direction cancel delay
H system information				07 Inspection stopping delay
				08 Fire running delay

P6 communication setting
P7 drive information
PE factory only
A1 floor setting
A2 floor displaying
H0 logic of the IO control board
H1 logic of the car control board
H2 front door stopping floor
H3 rear door stopping floor
H4 front/ rear door stopping floor
L0 parallel and group control setting
T0 time setting
F0 function setting
U0 calling signal
U1 system monitoring
U2 hoistway information

09 Arrival gang delay
11 Thermal protection reset delay
12 Advanced opening delay
13 Peristaltic landing overtime
14 Speed given delay
15 Braking voltage shifting delay
16 Keeping time of opening delay
17 Entire running protection time
18 Single floor running protection time

Function code	Instruction	Setting range 【default value】	Remarks
T0_00	Open delay	0～500s【3】	Not modify in running
T0_00 set the time from door open to automatic closing.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_02	Return to the home floor delay	0～5000s【120】	Not modify in running
T0_02 set the time from the free elevator to returning to the home floor.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_03	Free energy-saving delay	0～5000s【60】	Not modify in running
T0_03 set the time from free elevator to entering into the energy-saving state.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_04	Brake opening delay	0～5.000s【0.2】	Not modify in running
T0_05	Brake closing delay	0～5.000s【0.4】	
Above parameters set the braking control sequence. T0_04: the time from running direction given to the output braking. T0_05: the time form speed cancel to the braking cancel			

Function code	Instruction	Setting range 【default value】	Remarks
T0_06	Starting shake prevention delay	0～5.000s【0.3】	Not modify in running
T0_06 set the time from lock connection to the running contactor output. It can not set to be 0 when manual door.			

Note	◆ Adjust the parameter when the door shakes when door closed.

Function code	Instruction	Setting range 【default value】	Remarks
T0_07	Direction cancel delay	0～5.000s 【0.2】	Not modify in running
T0_00 set the time from door open to automatic closing.			

Note	◆ Adjust the parameter when the braking travel switch is not sensitive.

Function code	Instruction	Setting range 【default value】	Remarks
T0_08	Inspection stopping delay	0～5.000s【0.300】	Not modify in running
Set the time from speed cancel to braking cancel in inspection state.			

Note	◆ Valid when the parameter is more than or equal to 0.300, otherwise the braking and speed will cancel in inspection stopping.

Function code	Instruction	Setting range 【default value】	Remarks
T0_09	Fire running delay	0～5.000s【0.000】	Not modify in running
Set the time form elevator forced stop to the fire floor entering into the fire state.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_10	Arrival gang delay	0～5.000s【0.000】	Not modify in running
Set the time from the arrival gang output to canceling the arrival gang.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_11	Thermal protection reset delay	0～5000s【600】	Not modify in running
Set the time form thermal protection switch reset to rerunning of the elevator.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_12	Advanced opening delay	0～5.000s【0.000】	Not modify in running
Set the advanced opening delay time. And set T0_12 to be 0 to cancel the function.			

Function code	Instruction	Setting range 【default value】	Remarks
T0.13	Peristaltic landing overtime	0～5.000s【0】	Not modify in running
Set the protection time of peristaltic landing running and set it to 0 to cancel the function.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_14	Speed given delay	0～5.000s 【0.500】	Not modify in running
Set the time from the braking output and receiving the feedback to the given speed.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_15	Braking voltage shifting delay	0～5.000s【0.000】	Not modify in running
The time from output braking to output braking shifting.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_16	Keeping time of opening delay	0～500s【30.0】	Not modify in running
Press the opening delay button, and the system will close the door automatically after the set time. Press closing button can close the door in advance.			

Note	◆ Enable the function after parameter setting. The parameters forced to adjust automatically are as follows: F0-07=1, DOD in the car (same as IND) for the opening delay button; F0-15=1x, DOD at the car top for the opening delay light.

Function code	Instruction	Setting range 【default value】	Remarks
T0_17	Entire running protection time	0～100s【45】	Not modify in running
This parameter is used to limit the running time of the motor. The elevator will stop immediately when the time is arrived. Need manual or power off reset.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_18	Single floor running protection time	0～100s【45】	Not modify in running

This parameter is used to set the single floor running protection time for the higher floors.

6.5.18 Parameters setting – function setting

【main menu】	【parameters setting inquiry】	【F0 function setting】
A system control	P0 master drive control	00 High/low voltage detection
B fault record	P1 speed and deceleration distance	01 Hand door enabling
C language selection	P2 motor parameters	02 Closing output delay
D parameters setting inquiry	P3 encoder parameters	03 Fire safety mode
E password setting	P4 running comfortability	04 Closing output condition of dual doors
F system autotuning	P5 elevator protection parameters	05 Floor opening mode of parallel outside calling
G data management	P6 communication setting	06 Reset mode of running fault overtime
H system information	P7 drive information	07 MF definition of IND
	PE factory only	08 Internal command limit times
	A0 reserved	09Dual door control mode
	A1 floor setting	10 Output landing of fire forced landing
	A2 floor displaying	11 Floor internal command opening enabling
	H0 logic of the IO control board	12 LINE1 multi-function definition
	H1 logic of the car control board	13 LINE2 multi-function definition
	H2 front door stopping floor	14 LINE3 multi-function definition
	H3 rear door stopping floor	15 MF output in the car
	H4 front/ rear door stopping floor	16 test mode
	L0 parallel and group	17 relative selection of CAN communication
		18 relative selection of

	F0 function setting	sampling
	U0 calling signal	20 filter coefficient of stop
	U1 system monitoring	curve
	U2 hoistway	21 peristaltic landing
	information	distance
		22 UPS application
		57 front door IC open floor1
		58 front door IC open floor2
		……
		98 reserved

Function code	Instruction	Setting range 【default value】	Remarks
F0_00	High/low voltage detection	0～2【2】	Not modify in running
Select for the safety circuit, hall lock and car lock circuit.			
0: only detect high voltage, detect the BJ4 terminal			
1: only detect low voltage, detect the 1KSAF and 1KDL in AJ2			
2: detect high/low voltage			

Function code	Instruction	Setting range 【default value】	Remarks
F0_01	Hand door enabling	0～1【0】	Not modify in running
0: invalid			
1: arrival without open/closed detection. The elevator continues to run after switch off the door lock.			

Note	◆ If energy saving is necessary in the state, set the closed signal to normally closed attribute.

Function code	Instruction	Setting range 【default value】	Remarks
F0_02	Closing output delay	0～600s【0.5】	Not modify in running
0: do not output closing signal after the door is closed			
1-599 is the closing keeping time after the door is closed			
600: continuous closing signal output			

Function code	Instruction	Setting range 【default value】	Remarks
F0_03	Fire safety mode	0～3【0】	Not modify in running
0:China fire safety			
1: Australia fire safety			
2: Britain fire safety			
3: Special function for fire safety 2012			

Note	◆ Britain fire safety is also applicable in Hongkong. Enter the fire safety mode by IND. ◆ As for special function for fire safety 2012, output alarm and low speed opening by OUT1 and OUT2, or output by F0-15 mapping onto car board DOD and PAS light.

Function code	Instruction	Setting range 【default value】	Remarks
F0_04	Closing output condition of dual doors	0～1【0】	Not modify in running
0: dual door output closing signal when the door lock is blocked			
1: end the closing command after the door closed			

Note	◆ Set F0-02 to non-zero when selecting dual door output closing signal. ◆ F0-02 closing output delay when selecting to end the closing command after the door closed.

Function code	Instruction	Setting range 【default value】	Remarks
F0_05	Floor opening mode of parallel outside calling	0～2【0】	Not modify in running
0: main and sub elevator opening at the same time 1: main elevator opening 2: sub elevator opening			

Function code	Instruction	Setting range 【default value】	Remarks
F0_06	Reset mode of running fault overtime	0～1【0】	Not modify in running
0: manual reset 1: returning to leveling automatically			

Function code	Instruction	Setting range 【default value】	Remarks
F0_07	MF definition of IND	0～3【1】	Not modify in running
0: original definition 1: keep opening delay 2: select front/rear door 3: fire fighter input			

Function code	Instruction	Setting range 【default value】	Remarks
F0_08	Internal command limit times	0～5【0】	Not modify in running
0: without LL function			
1-5: record signal times limit when LL			

Function code	Instruction	Setting range 【default value】	Remarks
F0_09	Dual door control mode	0～1【1】	Not modify in running
0: dual control box mode			
1: single control box mode			

Note	◆ Set car logic to 3 when selecting dual control box mode. (Refer to the set value of car logic1.)

Function code	Instruction	Setting range 【default value】	Remarks
F0_10	Output landing of fire forced landing	0～1【0】	Not modify in running
0: output after forced landing			
1: output only in the home floor after forced landing			

Function code	Instruction	Setting range 【default value】	Remarks
F0_11	Floor internal command opening enabling	0～1【0】	Not modify in running
0: disabled			
1: enabled (applicable to IC card or no open button)			

Function code	Instruction	Setting range 【default value】	Remarks
F0_12	LINE1 multi-function definition	0～40【24】	Not modify in running
F0_13	LINE2 multi-function definition	0～40【25】	
F0_14	LINE3 multi-function definition	0～40【30】	

Definition of F0_12—F0_14:

0 self-definition	21 motor thermal protection
1 no definition	22 fire action input
2 no definition	23 no definition
3 medium speed down forced speed-changing switch	24 full load signal
4 medium speed up forced speed-changing switch	25 overload signal
5 high speed down forced speed-changing switch	26 no definition
6 high speed up forced speed-changing switch	27 no definition
7 down limit	28 advanced opening feedback
8 up limit	29 advanced opening adhesion
9 emergency electric running	30 Earthquake
10 inspection signal	31 no definition
11 inspection up button signal	32 no definition
12 inspection down button signal	33 open
13 up door area (rear door opening inspection)	34 close
14 down door area	35 UPS output signal inspection
15 no definition	36 dual braking travel detection

16 no definition	37 star-delta output detection
17 lock elevator signal	38 no definition
18 contact point of the drive output contactor	39 no definition
19 contact point of the braking contactor	40 no definition
20 braking travel switch detection	

Function code	Instruction	Setting range 【default value】	Remarks
F0-15	MF output in the car	0~65535【0】	Not modify in running
Unit: define RDC port of DC01, LED light corresponding to PAS			
Ten: define RDO port of DC01, LED light corresponding to DOD			
0: closing/opening output light of rear door			
1: opening delay light			
2: mapping PLC OUT11 of I/O board (following output and close of OUT11)			
3: mapping PLC OUT12 of I/O board (following output and close of OUT12)			
4: low speed opening signal (special function for fire safety 2012, F0-03=3)			

Function code	Instruction	Setting range 【default value】	Remarks
F0_16	Test mode	0～65535【0】	Not modify in running
0: no operation			
1: allow communication reset at drive fault			
8: close at fast arrival and shield calling (generally for debugging or test mode)			
The parameter is multi-function selective. Several functions can be effective simultaneously by adding corresponding values. For example, when allowing communication reset at drive fault and close at fast arrival, set 1+8=9.			

Function code	Instruction	Setting range 【default value】	Remarks
F0_17	Relative selection of CAN communication	0～65535【0】	Not modify in running

0:no operation

1:open protocol (Both calling board and car board are connected to the same line.)

2:overload voltage of car weighting sensor>full load voltage>light load voltage (also applicable to weighting sensor of the engine room)

4:fast stop internal command number clearance, if not, deceleration point number clearance

The parameter is multi-function selective. Several functions can be effective simultaneously by adding corresponding values. For example, when clearing number at internal command of fast stop in door area under open protocol, set 1+4=5.

Note	◆ When configuring calling board of the company, do not set to open protocol. ◆ After changing into open protocol, power on the car control board or car board after adjustment. The MF output in the car and car weighting compensation are cancelled. ◆ The parameter will not involve in default value reset.

Function code	Instruction	Setting range 【default value】	Remarks
F0_18	Relative selection of elevator running	0～65535【0】	Not modify in running

0:no operation

1:calling below 32 floor connected to inside line

2:parallel calling scan in cycle

4:speed involved in parallel control calculation

8:communication IC card enabling

16:no number clearance of internal calling remote reverse enabling

32:home floor opening standby enabling

64:during home floor opening standby, energy saving enabling (door beam will automatically cancel energy saving in the state.)

The parameter is multi-function selective. Several functions can be effective simultaneously by adding corresponding values. For example, when enabling communication IC card, keeping home floor opening and energy saving are necessary, set 8+32+64=104.

Function code	Instruction	Setting range 【default value】	Remarks
F0_19	1387 encoder C/D phase sampling	0～65535【0】	Not modify in running

When the synchronous master lacks comfortablity or the running current is high, and autotuning angle is unstable, redo autotuning after modifying P3.06~P3.08 as follows:to guarantee validity of sampling values, the motor runs at slow speed and rotates over 360°. Av_C is P3.07 C-phase magnetic pole bias and Av_D is P3.08 D-phase magnetic pole bias.

0:current sampling value

1:the max. value in latest running, marked as Max_C and Max_D

2:the min. value in latest running, marked as Min_C and Min_D

4:the bias out of latest running calculation, marked as Av_C and Av_D

Function code	Instruction	Setting range 【default value】	Remarks
F0_20	Filter coefficient of stop curve	0～65535【0】	Not modify in running

0:disable

Valid range 1～255 (generally unnecessary to set the value, modifiable when the elevator shakes after stopping in door area)

Function code	Instruction	Setting range 【default value】	Remarks
F0_21	Peristaltic landing distance	0～65535【0】	Not modify in running

0:disable

Valid range 10～200mm (modifiable when the asynchronous motor drives by pulley or long floor rope slides)

Function code	Instruction	Setting range 【default value】	Remarks
F0_22	UPS application	0～65535【0】	Not modify in running

0:220V power supply (The switching of drive power supply is controlled by OUT12. Set KPWR input to normally closed logic. Detect UPS output feedback and bus voltage. After leveling open delay, disconnect OUT12.)

1:380V power supply (The switching of drive power supply is controlled by UPS itself. UPS bus voltage detection is unnecessary. After leveling open delay, output OUT12, KPWR input optional.)

Function code	Instruction	Setting range 【default value】	Remarks
F0_57	Communication IC card of front door 1～16 floor	000～65535【0】	Not modify in running
F0_58	Communication IC card of front door 17～32 floor	000～65535【0】	
F0_59	Communication IC card of front door 33～48 floor	000～65535【0】	
F0_60	Communication IC card of front door 49～64 floor	000～65535【0】	

After enabling the communication IC card (in F0_18, bit3=1), open up 1～64 floor of front door by F0_57～F0_60. The set floor will record internal command without using IC card.

For example, in a shopping mall, parking is under the 1st floor, home landing on the 1st floor, stores on 2～5 floors, restaurants on the 12th floor, and other floors are private. The intelligent control solution by using communication IC card is as follows:

When F0_18=8, the communication IC card is enabled. The home landing is fixed open floor in no need of setting; set F0_57 to 1+4+8+16+32+4096=4157 to open up floors of the underground parking, stores and restaurants.

【F0_57 front door 1-8 floor】	Valid IC	Set value	【F0_57 front door 9-16 floor】	Valid IC	Set value
1 floor	0	1	9 floor	0	256
2 floor	0	2	10 floor	0	512
3 floor	0	4	11 floor	0	1024
4 floor	0	8	12 floor	0	2048
5 floor	0	16	13 floor	0	4096
6 floor	0	32	14 floor	0	8192
7 floor	0	64	15 floor	0	16384
8 floor	0	128	16 floor	0	32768

Function code	Instruction	Setting range 【default value】	Remarks
F0_61	Communication IC card of rear door 1～16 floor	000～65535【0】	Not modify in running
F0_62	Communication IC card of rear door 17～32 floor	000～65535【0】	
F0_63	Communication IC card of rear door 33～48 floor	000～65535【0】	
F0_64	Communication IC card of rear door 49～64 floor	000～65535【0】	
After enabling the communication IC card (in F0_18, bit3=1), open up 1～64 floor of rear door by F0_61～F0_64. The set floor will record internal command without using IC card. 1 indicates open up and 0 indicates IC card is valid. The setting is the same as above setting of front door floors.			

6.5.19 Parameters setting – calling signal

【main menu】 ☞ ENT 【parameters setting inquiry】 ☞ ENT 【U0 calling signal】

【main menu】	【parameters setting inquiry】	【U0 calling signal】
A system control	P0 master drive control	Random calling enabling
B fault record	P1 speed and deceleration distance	
C language selection	P2 motor parameters	
D parameters setting inquiry	P3 encoder parameters	
E password setting	P4 running comfortability	
F system autotuning	P5 elevator protection parameters	
G data management	P6 communication setting	
H system information	P7 drive information	
	PE factory only	
	A1 floor setting	
	A2 floor displaying	
	H0 logic of the IO control board	
	H1 logic of the car control board	
	H2 front door stopping floor	
	H3 rear door stopping floor	
	H4 front/ rear door stopping floor	
	L0 parallel and group control setting	
	T0 time setting	
	F0 function setting	
	U0 calling signal	

	U1 system monitoring	
	U2 hoistway	
	information	

10 times of the set value of U0_00 for random calling enabling is the random running time. It will be cleared after powering off.

6.5.20 Parameters setting—system monitoring

【main menu】	☞ ENT	【parameters setting	☞ ENT	【U1 system
A system control		inquiry】		monitoring】
B fault record		P0 master drive		Running time low bit
C language		control		Running time high bit
selection		P1 speed and		Total running time low bit
D parameters setting		deceleration distance		Total running time high
inquiry		P2 motor parameters		bit
E password setting		P3 encoder		Current elevator
F system autotuning		parameters		reference speed
G data management		P4 running		Reference frequency
H system		comfortability		monitoring
information		P5 elevator protection		Magnetic pole position
		parameters		angle
		P6 communication		Static autotuning
		setting		detection current
		P7 drive information		C-phase sampling
		PE factory only		D-phase sampling
		A1 floor setting		Current height of the
		A2 floor displaying		elevator
		H0 logic of the IO		Current floor of the
		control board		elevator
		H1 logic of the car		Leveling distance
		control board		Input terminal state 1-16
		H2 front door		Input terminal state
		stopping floor		17-32
		H3 rear door stopping		Extension input terminal
		floor		state
		H4 front/ rear door		High voltage input state
		stopping floor		Input terminal state of
				the main board in car

L0 parallel and group control setting	Output terminal state
T0 time setting	Current feedback speed of the elevator
F0 function setting	Running state of the elevator
U0 calling signal	Output current
U1 system monitoring	Output voltage
U2 hoistway information	Output frequency
	Output rotating speed
	Output power
	Bus voltage
	Torque command
	Torque compensation
	Current load
	Calculated deceleration distance
	Calculated stopping distance
	Analog input voltage
	Extension output terminal state
	Output state of the main board in car

6.5.21 Parameters setting – hoistway information

The parameters are used to watch the floor height and installation distance of the deceleration switch after the elevator autotuning.

【main menu】		【parameters setting inquiry】		【U2 hoistway information】
A system control	ENT	P0 master drive control	ENT	**Total height of the floor**
B fault record		P1 speed and deceleration distance		Low speed down forced deceleration distance
C language selection		P2 motor parameters		Low speed up forced deceleration distance
D parameters setting inquiry		P3 encoder parameters		Medium speed down forced deceleration
E password setting				
F system autotuning				
G data management				

H system information	P4 running comfortability	distance
	P5 elevator protection parameters	Medium speed up forced deceleration distance
	P6 communication setting	High speed down forced deceleration distance
	P7 drive information	High speed up forced deceleration distance
	PE factory only	Longest floor distance
	A1 floor setting	Shortest floor distance
	A2 floor displaying	
	H0 logic of the IO control board	
	H1 logic of the car control board	
	H2 front door stopping floor	
	H3 rear door stopping floor	
	H4 front/ rear door stopping floor	
	L0 parallel and group control setting	
	T0 time setting	
	F0 function setting	
	U0 calling signal	
	U1 system monitoring	
	U2 hoistway information	

6.6 Password setting

【main menu】 ☞ ENT 【password setting】

A system control   (1)monitoring password

B fault record   (2)debugging password

C language selection   (3)factory password

D parameters setting

inquiry

E password setting

F system autotuning

G data management

H system information

6.7 System autotuning

【main menu】 ☞ ENT 【system autotuning】

A system control   [1] hoistway information

B fault record   autotuning of the

C language selection   elevator

D parameters setting   [2] motor rotating

inquiry   autotuning

E password setting   [3] motor static

F system autotuning   autotuning

G data management   [4] LL weighting

H system information   autotuning

                                    [5] FL weighting

                                    autotuning

                                    [6] OL weighting

                                    autotuning

6.8 Data management

【main menu】 ☞ ENT 【data management】

A system control   [1] data saving of the

B fault record   controller

C language selection   [2] restore to the factory

D parameters setting   value

inquiry   [3] fault history

E password setting   clearance

```
F system autotuning
G data management
H system information
```

```
[4] data of the controller
to PAD
[5] PAD data to the
controller
```

[1]Data saving of the controller: save the data after changing. If not, the data will restore to the original ones.

[2]Restore to the factory value: restore the parameters of the controller to the factory setting.

[3]Fault history clearance: clear the fault history.

[4]Save the data of the controller to PAD.

[5]Download PAD data to the controller. Note: operate on the menu of "data saving of the controller" to save data after powering off.

6.9 System information

```
【main menu】
A system control
B fault record
C language selection
D parameters setting
inquiry
E password setting
F system autotuning
G data management
H system information
```

☞ ENT

```
【system information】
Software version of the
main control :1.13
Software version of the
car:2.08
Software version of the
group control:0.00
DSP software version:
1.08
FPGA software
version:1.04
PAD software
version:1.17
Rated power: 011.0kW
Running time: 88H
2013/01/28 17:28 THU
```

The rated power is that of the integrated machine.

The running time is the accumulative running time of the elevator.

Chapter 7   Running at slow speed

7.1 Inspection before power on

7.1.1 Machinery assembly, inspection and confirmation

➢ Bracket, rail, traction machine, car, rope, control cabinet, governor are installed according to the standards

➢ Confirm all the assembly of the safety circuit are well installed and in the normal working state

➢ Check the installation of all hall and car doors to ensure valid action and normal working state

➢ Dismount all scaffolds and other obstacles in the hoistway.

7.1.2 Electrical assembly, inspection and confirmation

1.   Check the connection of:

● Three-phase wires between the power supply cabinet and the control cabinet

● The connection between the braking coil of the master and the control cabinet.

● The connection between U1, V1 and W1 of the control cabinet and the three-phase wires of the master motor.

● The connection between the master encoder and the control cabinet.

● The safety circuit

● The door circuit

● The car connection

● ON-OFF logic of the inspection circuit

● Power supply and signal connection of the door operator

● CAN-BUS communication circuit connection of the car

● CAN-BUS communication circuit connection of the hoistway

2.   Connect the communication cables of the hoistway and car to the control cabinet

● Confirm the connection of the terminal resistor on the DC-03A board in the car

● Ensure the connection of the terminal resistor on the DC-03A board in the bottom hoistway module

● Connect the hoistway communication module, the resistance is about 60Ω.

● Connect the car communication module, the resistance is about 60Ω.

3.   Check the resistance of three phase of the motor

4.   Check the grounding

In the following inspection, the resistor between the measuring terminal/parts and PE closes to infinity.

- Between R, S, T and PE
- Between the braking coil and PE
- Between safety circuit and PE
- Between door lock circuit and PE
- Between the control power supply and PE
- Between the communication circuit and PE
- Between motor U, V, W and PE
- Between the rotating circuit of the encoder and PE
- Between the unit signal terminal of the machine and the power terminal and PE
- Between the terminal in the inspection circuit and PE

In above inspection, if the resistor is a little small, please check immediately and find the solution.

In the following inspection, the resistor between the measuring terminal/parts and PE closes to infinitesimal (0~3Ω):

- Between mains power supply and PE
- Between the motor contact and PE
- Between the shield cable of the rotating encoder and PE
- Between the external metal host of the rotating encoder and PE
- Between the contact of the machine and PE
- Between the power contact and PE
- Between the braking contact and PE
- Between the control cabinet and door and PE
- Between the coil end and PE
- Between the governor and PE
- Between the car and PE
- Between the electrical door lock and PE
- Between the connector of the safety switch and PE

⚠	◆ Ensure the connection of the grounding wires in the power supply meet the national standards before debugging.

7.1.3 Inspection of the encoder assembly

- Ensure the fixing of the encoder and the is tightened enough and the coupling between the motor shaft and the outrigger shaft of the master.
- The connection of the encoder is brought into the control cabinet.
- If the connection cable is not long enough, it is necessary to lengthen the

cables and the cables should be shield cables. It is recommended to meld the connection wires and the wire should be isolated from each other with the metal shield.

- Connect according to the color of the connection diagram and the encoder.
- The shield cables are connected to the grounding terminal in the control cabinet
- The cable of the encoder should be arranged in the metal hose to the control cabinet. The ends should be connected with proper techniques and the end of the metal hose in the control cabinet should be grounded.

If the shield cable of the encoder is grounded , then it can not be connected, but ensure the cable is nor connected with any electrical terminal or grounding chassis.

7.2 Inspection after power on

1. Following steps is needed after the first inspection:
   - Ensure all the switches and fuses are off
   - Ensure the inspection/normal switch is in the right position, the emergence-stop switch is off.
   - Ensure the inspection switch on and in the car is in the right position.
   - Ensure there is nobody in the hoistway, car, on the top of the car and at the bottom of the hoistway and the elevator can run safely.
   - Ensure the working outside the hoistway does not affect the running of the elevator.
2. Check the site bus voltage, the 3-phase voltage is 400±7%VAC and the phase bias is no more than 15VAC. The single voltage between each phase and the N wire is 220±7%VAC. If N line and PE is connected, then the voltage between N-PE is no more than 30VAC.
3. Ensure the wire specification and the total switching capacity should reach the total requirements of the diagram.
4. Power on debugging if all inspections are correct.
5. Inspection after power on:
   - Switch on the main power switch and check the phase sequence relay, if the green light is on, the phase is normal, otherwise, switch off the power and exchange any two-phase lines.
   - Check the fault immediately if fault occurs.
     - A. Check the voltage between 24V+ and 24V- is 24.3V±0.3V.
     - B. Check the relay in the control cabinet

Relay name	Close/release
Phase sequence relay	Action

● Input the password on the manual controller and enter into the parameters menu. After checking the parameters, set according to the actual debugging.

7.3 Static self-tuning of the synchronous motor

⚡	Autotuning is needed before the first slow running of synchronous master, otherwise damage to the machine and motor and physical injury or death may occur.

The synchronous motor must conduct self-tuning before running; otherwise, damage to the machine and motor man occur because of incorrect parameters.

【main menu】	☞ ENT	【parameters setting inquiry】	☞ ENT	【P2 motor parameters】
A system control		P0 master drive control		00 motor type selection
B fault record		P1 speed and deceleration distance		01 rated power of the motor
C language selection		P2 motor parameters		2 rated frequency of the motor
D parameters setting inquiry		P3 encoder parameters		03 rated speed of the motor
E password setting		P4 running comfortability		04 rated voltage of the motor
F system autotuning		P5 elevator protection parameters		5 rated current of the motor
G data management		P6 communication setting		06 stator resistor of the motor
H system information		P7 drive information		07 rotor resistor of the motor
		PE factory only		08 Motor stator and rotor inductance
				09 Motor stator and rotor mutual inductance
				10 Motor non-load current

【main menu】 ☞ ENT 【parameters setting inquiry】 ☞ ENT 【P3 encoder parameters】

【main menu】	【parameters setting inquiry】	【P3 encoder parameters】
A system control	P0 master drive control	00 encoder type selection
B fault record	P1 speed and deceleration distance	01 resolution of the encoder
C language selection	P2 motor parameters	02 encoder direction
D parameters setting inquiry	P3 encoder parameters	03 encoder disconnection detection time at low speed
E password setting	P4 running comfortability	04 encoder disconnection detection time at high speed
F system autotuning	P5 elevator protection parameters	05 reversal detection time of the encoder
G data management	P6 communication setting	06 Amplitude gain pole position
H system information	P7 drive information	07 C-phase magnetic pole bias
	PE factory only	08 D-phase magnetic pole bias
		09 original position of the magnetic pole
		10 static identification current
		11 pulse counting direction

Function code	Instruction	Instruction
P0_00	Speed control mode	0-2【1】
P2_00	Motor type	0: AM 1: SM
P2_01	Rated power of the motor	To the name plate
P2_02	Rated frequency of the motor	To the name plate
P2_03	Rated speed of the motor	To the name plate
P2_04	Rated voltage of the motor	To the name plate
P2_05	Rated current of the motor	To the name plate

P3_00	Encoder type	0:Incremental encoder (asynchronous motor) 1:SIN/COS encoder（synchronous1387） 2:UVW encoder （synchronous 8192）
P3_01	Resolution of the encoder	1～10000
P3_06	Magnetic pole position amplitude gain	0.50～1.50 (normal 0.98～1.02)
P3_07	C-phase magnetic pole bias	0000～9999 (normal 390～400)
P3_08	D-phase magnetic pole bias	0000～9999 (normal 390～400)
P3_10	Static identification current	0～150% (depend on the master, generally 40～60%)

Enter into the system autotuning menu to select the motor static autotuning.

【main menu】	【system autotuning】
A system control	[1] hoistway information
B fault record	autotuning of the
C language selection	elevator
D parameters setting	[2] motor rotating
inquiry	autotuning
E password setting	[3] motor static
F system autotuning	autotuning
G data management	[4] LL weighting
H system information	autotuning
	[5] FL weighting
	autotuning
	[6] OL weighting
	autotuning

Steps of static autotuning	Check the connection of master UVW, connection wires, braking connection and encoder connection. Connect the safety and door lock circuit and check the parameters setting of master and encoder in the inspection state. Enter into the static identification current menu, set P3_10 and enter into the main menu—F system autotuning—[3] motor static autotuning. Then the operational interface of the manual controller will display "please confirm the inspection state?". If select [YES], then the

	interface will display "please confirm the autotuning?". If confirmed, master autotuning will begin. Reconfirm the brake is in the closing state, if select [YES], press the inspection up button, and then the running contactor will close automatically to begin the autotuning and the controller will display the motor is autotuning. After about 0.5s, the motor will squeak to end the autotuning and the running contactor releases automatically. If the master autotuning succeeds, the manual controller will display "autotuning succeed". Press ESC to retreat the interface, and then enter main menu—G data management—[1] data saving interface of controller to save the data. If the manual controller display "autotuning failed", find the fault reason.
Precautions in autotuning	In the master autotuning, if any abnormality occurs, press the emergency-stop button or switch off the power supply to stop the autotuning. If the autotuning is failed, first confirm the brake is closed or not, and the connection of the encoder and the static identification current is in 40～60%. Check the detection current of static autotuning U1_07 is in 80～120%; otherwise, static autotuning will repeat after changing the static identification current P3_10. In the autotuning, the direction of the encoder is not detected. Repeat the autotuning twice and record the value of P3_09. If the three results are the same, the setting of P3_02 is correct, otherwise change the setting of P3_02 and reautotune. Judge the direction of the elevator before the first trial running to avoid collision limit. If the inspection running direction is different from the actual direction, change the value of P0_08. Try to inspect the up/down running elevator when entering into U1_21. If the feedback current is in normal state, the motor autotuning is finished. Otherwise please check the parameters setting in P0, P2 and P3 group and the autotuning steps.

Enter into the autotuning:

【motor static autotuning】

Whether in the inspection state?

[Y]   [N]

Select [Yes] and enter:

【motor static autotuning】

Whether begin the motor autotuning?

[Y]   [N]

Select [Yes] and enter, and press the up inspection button:

【motor static autotuning】

Motor autotuning…

If succeeded, then

【motor static autotuning】

Successful autotuning

If failed, then

【motor static autotuning】

Autotuning failed

Note	◆ Save the parameters after autotuning.
	◆ The autotuning of asynchronous motor is the same as above. After finishing autotuning, update P2_06 ～P2_10.

7.4 Rotating autotuning of the motor

Ensure the wire rope on the motor is removed before the rotating autotuning and the input parameters are correct.

Function code	Instruction	Instruction
P0_00	Speed control mode	0-2【1】
P2_00	Motor type selection	0:AM 1:SM
P2_01	Rated power of the motor	According to the name plate
P2_02	Rated frequency	According to the name plate

Function code	Instruction	Instruction
	of the motor	
P2_03	Rated speed of the motor	According to the name plate
P2_04	Rated voltage of the motor	According to the name plate
P2_05	Rated current of the motor	According to the name plate
P3_00	Encoder type selection	0: Incremental encoder (asynchronous motor) 1:SIN/COS encoder（synchronous1387） 2:UVW encoder （synchronous 8192）
P3_01	Encoder resolution	1～10000

Enter into the main menu –F system autotuning to select motor rotating autotuning.

【main menu】		【system autotuning】
A system control		[1] hoistway information autotuning of the elevator
B fault record	ENT	
C language selection		
D parameters setting inquiry		[2] motor rotating autotuning
E password setting		[3] motor static autotuning
F system autotuning		[4] LL weighting autotuning
G data management		[5] FL weighting autotuning
H system information		[6] OL weighting autotuning

Steps of motor rotating autotuning	Check the connection of master UVW, connection wires, braking connection and encoder connection. Ensure the wire rope on the motor is removed before the rotating autotuning and no damage may occur during rotating.

	Connect the safety and door lock circuit and check the parameters setting of master and encoder in the inspection state.
	Enter into the main menu—F system autotuning—[2] motor rotating autotuning. Then the operational interface of the manual controller will display "please confirm the inspection state?". If select [YES], then the interface will display "please confirm the autotuning?". If confirmed, master autotuning will begin.
	The brake contactor is in the closing state when selecting [YES]. Press the inspection up button, and then the running contactor will close automatically to begin the autotuning and the controller will display the motor is autotuning. After about 30s, the motor will finish autotuning and the running contactor releases automatically.
	If the master autotuning succeeds, the manual controller will display "autotuning succeed". Press ESC to retreat the interface, and then enter main menu—G data management—[1] data saving interface of controller to save the data. If the manual controller display "autotuning failed", find the fault reason.
Precautions in autotuning	In the master autotuning, if any abnormality occurs, release inspection up button immediately, then press the emergency-stop button or switch off the power supply to stop the autotuning. If the autotuning is failed, first confirm the brake is closed or not. If the master vibrates during autotuning, enter into parameters of P4 group to reduce speed loop and current loop. If the master rotates abnormally and alarms encoder disconnection, repeat autotuning after modifying encoder direction P3_02. Record and compare the value of P3_09 three times. If the deviation is small and the running current at non-load is normal, the autotuning is successful; otherwise, check the setting of P0, P2 and P3 is consistent with parameters of the nameplate and encoder and the autotuning steps. Judge the direction of the elevator before the first trial running to avoid collision limit. If the inspection running direction is different from the actual direction, change the value of P0_08.

Enter into the autotuning:

【motor rotating autotuning 】

Whether in the inspection state?

[Y]   [N]

Select [Yes] and enter:

【motor rotating autotuning】

Whether begin the motor autotuning?

[Y]   [N]

Select [Yes] and enter, and press the up inspection button:

【motor rotating autotuning】

Motor autotuning…

If succeeded, then

【motor rotating autotuning】

Successful autotuning

If failed, then

【motor rotating autotuning】

Autotuning failed

Note	◆ Save the parameters after autotuning. ◆ The autotuning of asynchronous motor is the same as above. After finishing autotuning, update P2_06 ～P2_10.

7.5 Inspection running

1.   Switch on the general power and reset the emergency-stop switch of the control cabinet.

2.   Smooth safety circuit: normal phase sequence, emergency-stop button of the control cabinet reset.

3.   Smooth door lock circuit: serial circuit of the car and hall

4.   Smooth upper and lower bit circuit

5.   The up/down forced deceleration circuit need to keep smooth, otherwise the actual running speed is the leveling speed when slow running.

6.   Good connection of the inspection circuit

7.   Press the UP/DOWN button to run UP/DOWN at slow speed in inspection:

    （1）   The manual controller can display the current running speed or frequency when the elevator is running.

    （2）   Input the receiving and output state in the manual controller.

    （3）   Enter into the parameters setting—drive control of the master—running direction selection to change the running direction if the running direction of

the elevator is different from the direction of the button.

（4） Check the displayed speed in the manual controller. The up running is the positive value and the down running is the negative value. If abnormal, enter into the parameters setting—encoder parameters—pulse counting direction to the change the value.

（5） Check if the displayed speed in the manual controller corresponds to the set speed. If the fluctuation is large, check the grounding of the encoder and the motor.

（6） When the elevator slides at starting, enlarge speed loop gain P4_00 properly. The synchronous motor needs to check whether P4_14 is set to 1 and enlarge P4_17 properly.

（7） When sliding at stop, extend inspection stop delay.

8. Carry out the rest connection if the slow running of the engine room is normal.

Chapter 8   Debugging at fast speed

8.1 Inspection and confirmation of the electrical assembly

1.   The connection of the engine room and beam are correct.

2.   The connection and installation size of the leveling switch on the car top are correct.

3.   All safety circuit in the hoistway can act validly.

4.   The installation position of the up/down limit switches in the hoistway is correct and can act validly.

5.   The installation position of the up/down limit switches is correct and can act validly.

6.   The installation position of the up/down forced deceleration switches are correct and can act validly.

Terminal deceleration switch: if the speed of the elevator is less than 1. 5m/s, install two deceleration switches SDS1 and SUS1; **if the speed of the elevator is between** 1. 75 ~ 2 m/s, install up/down deceleration switch SDS2 and SUS2; **if the speed of the elevator is more than** 2 m/s, install 3 deceleration switches and add SDS3 and SUS3. the distance between the switch and the terminal leveling position corresponds to each deceleration distance in each stage.

7.   The connection of the interphone is connection and can work normally.

8.   The connection of the arrival gang is correct.

9.   The connection of the calling communication board is reliable and correct.

10. Switch off the main power supply and check the communication wires.

⑴ check the connection of J3 on DC-03A board in the car.

⑵ measure the module cable of the hoistway communication to keep about 60Ω.

⑶ measure the module cable of the car communication to keep about 60Ω.

11. The connection of the car light and fan are correct.

8.2 Power on and check

1.   Following steps need to be confirm and check after the action in section 1:

（1）   Switch off the power supply.

（2）   Ensure all switches are off.

（3）   Ensure all inspection/automatic switches are in the inspection position and the emergency-stop switch is pressed.

（4）   Ensure there is nobody in the hoistway and car and the elevator is in the safe condition.

（5）   Ensure the running of the elevator is not affected by the outside.

2.   Inspection and debugging of the door

（1）   Switch on the power supply.

（2） Restore the emergency-stop switch of the control cabinet.

（3） Switch on the power supply of the door of the control cabinet and the inspection/automatic switch in the inspection position.

（4） Ensure the voltage between the power terminal of the door is 220V±7%VAC.

（5） Debug according to the instruction of the door.

（6） Check the opening and closing of the door.

    A． Set the door in the automatic state and the door is closed.

    B． Press the opening relay and the door opens.

    C． Press the closing relay and the door closes.

    D． When the door is open totally, press the UP/DOWN button, the door closes automatically.

（7） Check the door closed/open actions.

A. Stop the elevator in the leveling position and dial the inspection/automatic switch in the normal position and the door is closed.

B. Monitor the automatic state in the manual controller.

3. Inspection of the beam

Check and correct according to the installation of the beam. In the automatic mode, enter to monitor the input state:

（1） Switch off the power supply of the elevator and connect the car communication, and then switch on the power supply.

（2） Confirm the display screen of the car is correct and change with the displaying on the manual controller in the control cabinet.

（3） Short circuit J3.

4. Connection inspection of the leveling sensor

（1） Connect the leveling sensor according to the diagram.

（2） Inspect the signal of the leveling sensor.

（3） Inspect the position of the limit switch.

The car runs up until to the up limit switch acts, then the sill of the car is above the sill of he hall about 50mm.

The car runs down until to the down limit switch acts, then the sill of the car is below the sill of he hall about 50mm.

Cross-circuit the up/down limit switch, and the car goes up/down until the safety switch acts, and then the sill of the car is above the sill of he hall about 250mm.

The car runs down until to the down limit safety switch acts, then the sill of the car is below the sill of he hall about 250mm.

After the adjustment, remove the cross-connection and restore the original connection.

5.　　Inspection and adjustment of the terminal forced deceleration switch

Up terminal forced deceleration switch and down terminal forced deceleration switch

The elevator runs up to the up terminal forced deceleration switch acts, then the sill of the car is below the sill of he hall about X (refer to 4.5.2).

The elevator runs down to the down terminal forced deceleration switch acts, then the sill of the car is above the sill of he hall about X (refer to 4.5.2).

After the adjustment, restore the original connection.

6.　　Check the installation position and quantity of each leveling plate.

8.3 Parameter check

Check the controller parameters one by one according to the actual technical parameters. If there is non-stopping floor in site and the non-sopping floor has no magnet vane, please set the total floor as the actual stopping floor.

8.4 Autotuning of the hoistway position

1.　　set the autotuning speed of the elevator is 0.20m/s and the elevator is in the state of engine room inspection state.

2.　　before autotuning, stop the elevator at the bottom with the position of more than 1 leveling switches action other than the position of down limit switch action. At the time, the single down terminal deceleration switch need to act and confirm the corresponding signal on the main board.

3.　　keep the safety circuit smooth.

4.　　ensure the safety running of the elevator in the hoistway.

5.　　begin the autotuning through the manual controller.

　　（1）Enter into the system autotuning menu and select the hoistway autotuning.

【main menu】	【system autotuning】	【hoistway information autotuning of the elevator】
A system control	[1] hoistway information autotuning of the elevator	Please confirm the position of the forced speed changing switch?
B fault record		
C language selection		
D parameters setting inquiry	[2] motor rotating autotuning	
E password setting	[3] motor static autotuning	[Y]　[N]
F system autotuning		【 forced speed changing distance instruction】
G data management	[4] LL weighting autotuning	
H system information	[5] FL weighting	

	autotuning	First level:
	[6] OL weighting autotuning	1200mm Second level: 2400mm
Select [Y] to enter	Select [Y] to enter	Select [Y] to enter
【hoistway information autotuning of the elevator】 Please ensure the inspection state? Please ensure whether it is in the inspection state? Whether the car is in the door area of ground floor? [Y]　[N]	【hoistway information autotuning of the elevator】 Please ensure to begin the hoistway information autotuning of the elevator? [Y]　[N]	【hoistway information autotuning of the elevator】 hoistway information autotuning… Current floor: 1 Car position: 0mm Elevator speed: 0mm/s

After confirmation, press the inspection up button until the elevator leaves the door area and release, and then the elevator will begin autotuning at the inspection speed and record the position of the leveling plate and the up/down terminal deceleration switches.

（2）The manual controller will display the relative information on floor and speed.

When the elevator runs to the top door area, the system will end the autotuning and the manual controller will display the following interface:

【hoistway information autotuning of the elevator】 Succeeded.
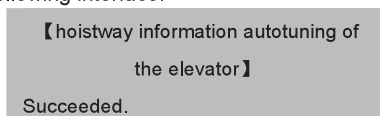
（3）Save the autotuning data and retreat the displaying of the manual controller to the state interface.

If failed, then

【hoistway information autotuning of the elevator】 Failed.
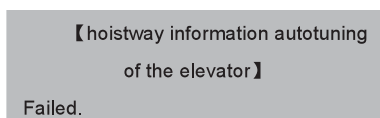
8.5 Autotuning of the hoistway position by the up/down button

The autotuning of the hoistway position operated by the up/down button on the panel:

1. Inspect running to the door area at the bottom

2. Press the up and down buttons simultaneously for about 5s until the LED displays 1

3. Press the up button and do not release it

4. Press inspection up button, then the LED displays the floor and the decimal point flickers

5. Release the up button on the panel and inspection up button after leaving the door area

6. When the elevator runs to the door area at the top:the LED will displays "OP" if autotuning succeeded and "Er" if autotuning failed.

Note	◆ The high speed counting is in reverse direction. When the elevator goes up, the current height reduces. Please make adjustment according to the precautions of the master in autotuning; ◆ The number of light panels in door area and the total floors have position deviation or different setting. Please check whether the signals from door area is consistent with the total floors; ◆ Down low speed forced deceleration switch does not reset or is offline; ◆ Up low speed forced deceleration switch adhesion or installed too high; ◆ Due to each adjustment on the deceleration switch, redo the hoistway autotuning.

8.6 Run at fast speed

⚠	◆ Ensure the 3 safety switches are correct and reliable. ◆ Ensure there is no short circuit of the car and hall lock and the locks can work normally. ◆ Ensure the forced deceleration switches and limit switched can work normally. ◆ Ensure the hoistway autotuning are succeeded. And the logic setting of the I/O board and car main controller is correct. ◆ The elevator runs at slow speed to the leveling of the terminal landing. Correct the floor displaying and inspect normally. The elevator will open and close the door

	automatically to ensure the outside/inside calling communication is normal.
⚡	◆ Avoid terminal landing running in first running at fast speed.

Run at fast speed in the engine room after the hoistway autotuning, and monitor the feedback speed on the manual controller.

1. Check nobody is in the car, car top or pit and the doors of the hall and car are closed. Ensure the safety circuit and door lock circuit are normal.

2. Slowly run the elevator in the engine room to the medium floor, then change into automatic state. If input single-deck command in the controller, the elevator will run at single-deck speed. Inspect feedback speed, leveling signal and tractor to check if working normally; if not, adjust relative parameters.

3. After proper single-deck running, input double-deck command and make the elevator run at double-deck speed to check whether in normal state.

4. After proper double-deck running, input multi-deck command to check whether in normal state.

5. After proper multi-deck running, make the elevator run at multi-deck speed to the top and bottom to check whether in normal state.

6. After proper top/bottom running, check the up forced deceleration switch distance and down forced deceleration switch distance meet the requirements, and no top-hitting or bottom-clashing; otherwise, adjust the distance.

Note	◆ Reperform the hoistway autotuning after adjust the up/down forced deceleration switch.

8.7 S Curve adjustment
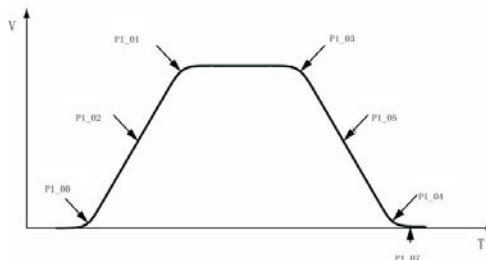
Figure 8-1 S Curve adjustment

8.8 Leveling adjustment

1.   The leveling plate are plugged in the photoelectric switch or magnetic switch for about 2/3 and check the depth of each plate are the same and as vertical as possible.

2.   Keep the center of the plate and sensor is in one line when installation.

3.   Record the distance between the car sill and hall sill when the elevator goes up/down to a floor.

4.   Leveling adjustment:

Adjust P1_14 if the up/down leveling precision is not in the right position, the basic value is 50-x and 50+x.

5.   Interference and bad quantity of the rotating encoder may affect the leveling precision.

Ensure the connection of the encoder is shield cable, and the shield layer needs to be grounded at the end of the control cabinet. The connection of the encoder and the power cables can not route in one trough.

Note	◆ Reperform the hoistway autotuning after adjust the leveling switch or magnet vane.

8.9 Comfortability

8.9.1 Vector control of the sequence in fast-running
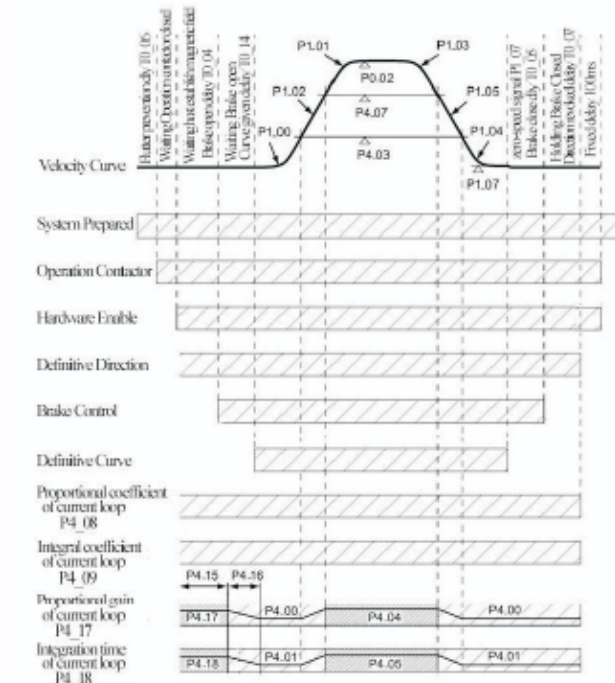
Figure 8-2 Sequence diagram

8.9.2 Adjustment of non-weighting compensation starting

1. set P4_14 to be 1, in the time set by P4_15, P4_17, P4_18, P4_19 , P4_20 and P4_21 are valid.

2. P4_16 is the transition time from speed loop zero speed (load compensation) to the low speed.

3. if the motor shocks in starting, increase P4_18 or P4_21.

4. if the elevator slides in starting, reduce P4_18 or increase P4_17. Increase P4_21 when adjust the load compensation speed loop to eliminate the vibration.

5. no need to set position loop parameters. Too high P4_19 may cause motor vibration.

8.9.3 Adjustment of the speed loop

Speed loop PI has a close relationship with the inertia of the system. Setting the proportional gain and integration time can adjust the dynamic response of the speed loop in vector control.

Shifting of the speed loop gain: when the running frequency is below P4_03, select P4_00 and

P4_01; if the running frequency is above P4_07, select P4_04 and P4_05; if the running frequency is between P4_03 and P4_07, select thorough the linear change of the parameters .

8.9.4 Adjustment of the current loop

The adjustment of P4_08 and P4_09 has an effect on the dynamic response speed and control performance of the system.

The factory setting of the current loop meet the needs basically. Reduce P4_08 and P4_09 if high frequency noise occurs and increase P4_08 and P4_09 if low-speed vibration occurs.

P4_08 is increasing with the sudden inductance of the motor and 4_09 is increasing with the resistance of the rotor.

8.9.5 Motor noise

Check and adjust P0_07, P4_08, P4_09 and P4_10 if the motor has noise in running.

8.9.6 Relative parameters

Fast running state	Relative parameters
Slide at the heavy side when starting	Adjust P4_14, set P4_15, reduce P4_18 and increase P4_17
Starting shock	Increase P4_18, reduce P4_17, adjust P4_21 or T0_14
Rapid acceleration and deceleration	Reduce P1_02 and P1_05
Vibration during acceleration and deceleration	Adjust P4_03 and P4_07
Shock acceleration and deceleration at the end	Adjust P1_01 and P1_04
Long leveling time	Reduce the acceleration and deceleration speed
Stopping vibration	Increase T0_05
Slide at the heavy side when stopping	Increase T0_07 and P4_00
Low-speed vibration	Adjust P4_00, P4_01
High-speed vibration	Adjust P4_04, P4_05
Entire running shock	Reduce P4_08, P4_09 and increase P4_02, P4_06, P4_10

8.9.7 Adjustment of weighting compensation

When the synchronous master adopts UVW encoder or pulley drives the asynchronous motor,

When the drive is in the power generation state, adjust P4_26. Increase compensation if not enough and decrease it if too high.

When the drive is in the motoring state, adjust P4_27. Increase compensation if not enough and decrease it if too high.

Chapter 9 User-specific design—Programmable logic control

9.1 Introduction

EC100 elevator intelligent integrated machine provides two multi-function output signal used to provide secondary development platform. Users can use the existing basic input and output points to logical combination of output. The Max. program support is 300 steps, meeting the need of users.

9.2 Programming software

The program software of integrated machine can be installed in PC through programmable design, after that, connect it with EC100 with program cables, the user can download programs.

Software interface:
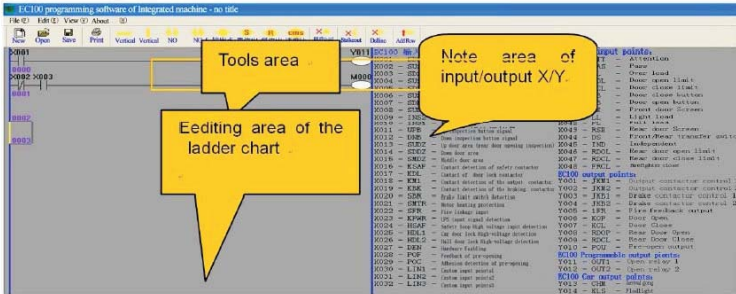
9.2.1 Shifting between the ladder chart and the command table

Click the ladder chart to enter into the program editing state of the ladder chart:
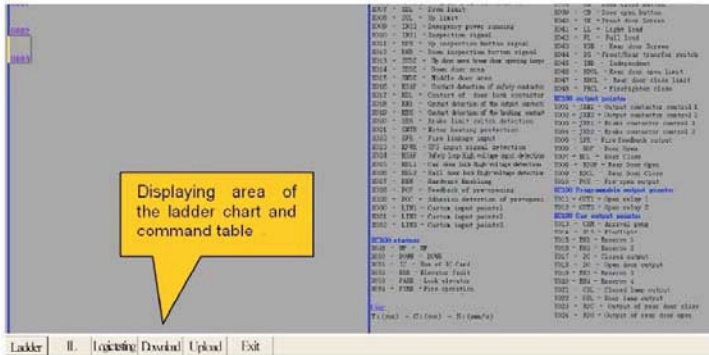
9.2.2 Logic test

Logic test is used on the logic simulation of the programs to solve the problems.
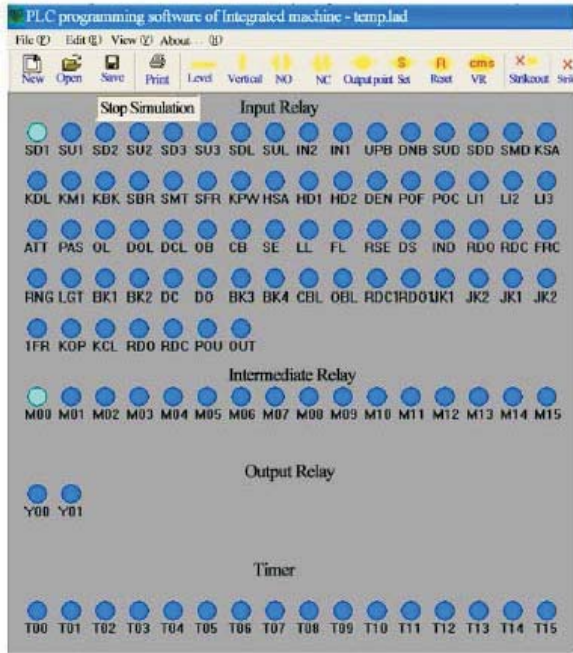
9.2.3 Code upload

Upload the codes in the controller to PC.

9.2.4 Code download

Download PC software to the controller.

9.3 Programming introduction

The software support ladder program and not provide command table program.

For example:

There are many relay, timer and counter in the programmable controller with usual NO and NC contactor.

The connection of contactor and coils compose the control circuit. Below is the introduction of some components.

9.3.1 Input relay X

Input relay (X) is used to receive the signal of external switch .

The address of X:

areas of X:

```
EC100 status
X049 — UP — UP
X050 — DOWN — DOWN
X051 — IC — Use of IC Card
X052 — ERR —Elevator fault
X053 — PARK —Lock elevator
X054 — FIRE —Fire operation
X007 — SDL — Down limit
X008 — SUL — Up limit
X009 — NS2 —Emergency power running
X010 — NS1 —Inspection signal
X011 — UPB — Up inspection button signal
X012 — DNB — Down inspection button signal
X013 — SUDZ — Up door area (rear door opening
X014 — SDDZ — Down door area
X015 — SMDZ — Middle door area
X016 — KSAF — Contact detection of safety conta
X017 — KDL — Contact of   door lock contactor
X018 — KM1 — Contact detection of the output   c
X019 — KBK — Contact detection of the braking
X020 — SBR — Brake limit switch detection
X021 — SMTR —Motor heating protection
X022 — SFR — Fire linkage input
X023 — KPWR —UPS input signal detection
X024 — HSAF —Safety loop High voltage input de
X025 — HDL1 —Car door lock High-voltage detect
X026 — HDL2 —Hall door lock High-voltage detec
X027 — DEN — Hardware Enabling
X028 — POF — Feedback of pre-opening
X029 — POC —Adhesion detection of pre-opening
X030 — LIN1 - Custom input points1
X031 — LIN2 - Custom input points2
X032 — LIN3 - Custom input points3

X030 — LIN1 - Custom input points1
X031 — LIN2 - Custom input points2
X032 — LIN3 - Custom input points3
EC100 Car input points
X033 — ATT — Attention
X034 — PAS — Pass
X035 — OL — Over load
X036 — DOL — Door open limit
X037 — DCL — Door close limit
X038 — OB —Door close button
X039 — CB —Door open button
X040 — SE —Front door Screen
X041 — LL —Light load
X042 — FL — Full load
X043 — RSE — Rear door Screen
X044 — DS —Front/Rear transfer switch
X045 — ND — Independent
X046 — RDOL — Rear door open limit
X047 — RDCL — Rear door close limit
X048 — FRCL —firefighter close
EC100 status
X049 — UP — UP
X050 — DOWN — DOWN
X051 — IC — Use of IC Card
X052 — ERR —Elevator fault
X053 — PARK —Lock elevator
X054 — FIRE —Fire operation
```

9.3.2 Output relay Y

```
EC100 output points
Y001 - JKM1 - Output contactor control 1
Y002 - JKM2 - Output contactor control 2
Y003 - JKB1 - Brake contactor control 1
Y004 - JKB2 - Brake contactor control 2
Y005 - 1FR - Fire feedback output
Y006 - KOP —Door Open
Y007 - KCL —Door Close
Y008 - RDOP - Rear Door Open
Y009 - RDCL - Rear Door Close
Y010 - POU - Pre-open output
EC100 Programmable output pionts
Y011 - OUT1 - Open relay 1
Y012 - OUT2 - Open relay 2
EC100 Car output points
Y013 — CHM - Arrival gong
Y014 — KLS - Floodlight
Y015 - BK1 - Reserve 1
Y016 - BK2 - Reserve 2
Y017 — DC - Closed output
Y018 — DO —Open door output
Y019 - BK3 - Reserve 3
Y020 - BK4 - Reserve 4
Y021 - CBL - Closed lamp output
Y022 - OBL - Door lamp output
Y023 — RDC —Output of rear door close
Y024 - RDO - Output of rear door open
```

The main board provide two programmable output relay OUT1 and OUT2 for the sub-development. The others are unprogrammable.

9.3.3 Assistant relay M

The assistant relay is the relay inside the controller.

Address configuration principle: 16 assistant relays M00-M15

Note	◆ The relay is different from input/output relay. It is used in the program, but can not receive the external output and drive the external load directly. ◆ Note that there is no power-off protection in the assistant relay.

9.3.4 Current speed comparison command CMS

It is used on the relay output at the regulated speed.

For example:
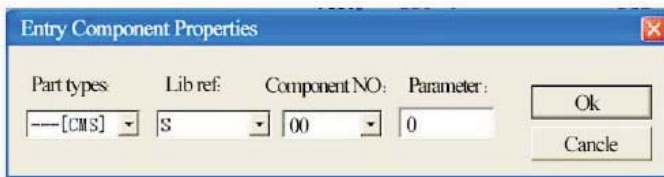
Speed Comparator S，when SXX is above the setting parameter （XX is any component code in 00-07）, the unit of the parameter is mm/s

For example:
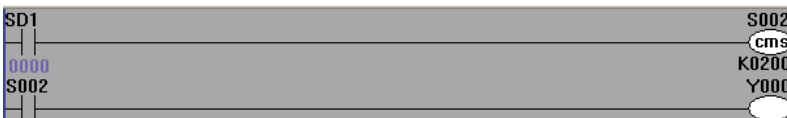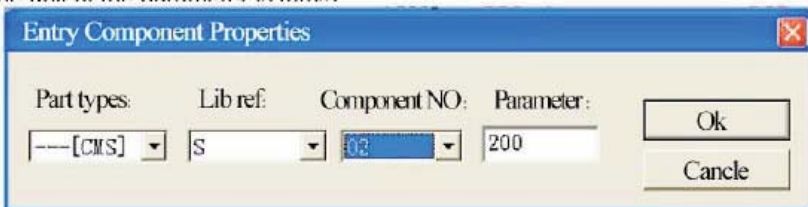
9.3.5 Timer T

Timer is used to add the pulse in the controller in 100ms, if reach the set value, output the contact action.

Address configuration principle: T00-T15 (16)

For example: when time reply is T00, the time is 为 200X0.1=20 seconds, max. setting value is 65535.
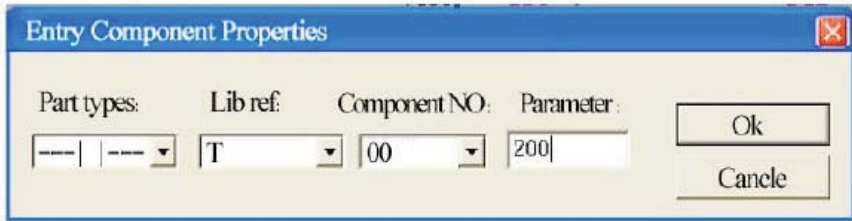
For example:
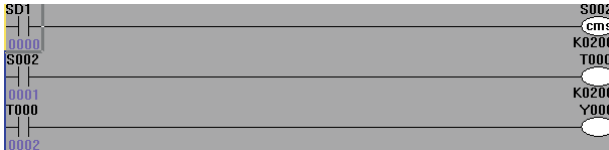
If the elevator does not act deceleration at low speed, output Y000 in T000 when the speed is more than 0.2m/s.

The Mini. Unit of the timer is 0.1s. the counter is raiding edge and the Max. step is 300.

9.3.6 Counter C

The counter can be classified according to the usage and application:

> ➢ Internal counter（general use/ keep on using when power off）
> ➢ 16-bit counter: increasing counting; counting range: 1~65535

C00-C09 general use, C10—C15is used on the internal signal of the controller. Its response speed is 10ms/time.

The figure above stands for that output Y001 when the opening times of breaker is accumulated to 2000.

9.3.7 Setting command S

Function: used on step ladder chart

Force Y000 to output when SD1 is on.
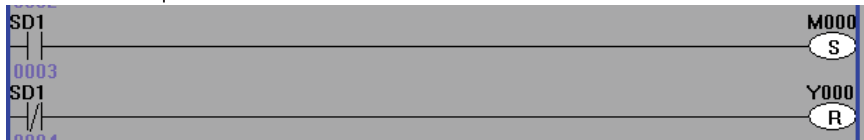
9.3.8 Reset relay R

Function: used on step ladder chart

Force Y000 to reset when SD1 is off

Chapter 10 Complete product description

10.1 Main controller DC-01 of the car

DC-01 is the main control board of the elevator car, including 16 digital signal input, NO signal output of 4 relays, command signal input of the connection interface of command board DC-02 and 12 floors of the elevator. It has terminals to perform CAN communication with main control board.

10.1.1 Installation size
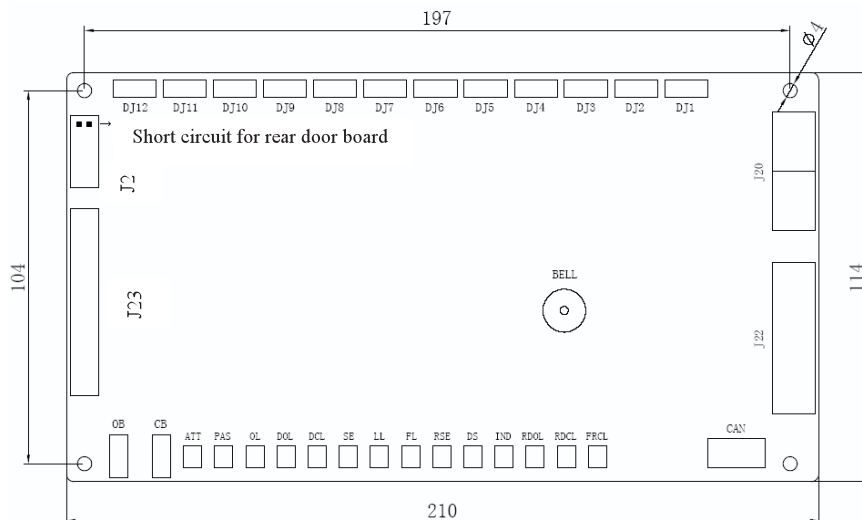
Figure 10-1 Installation dimension of the car main controller DC-01

Installation method:

1. Install when all power supplies are disconnected.

2. Fix with screws according to the installation holes.

3. Connect the terminals and tighten up.

10.1.2 Specification of the connectors

No	Model
J20/J21	2EG3.81-3
J22	2EG3.81-8
J4-J5/J24-J35	XH-4
J6-J19	XH-2
J23	26 pin dual arrangement base
J1	VH-4

J2	Short-circuit socket of rear door

10.1.3 Electrical specifications

10.1.3.1 Power supply specifications:

Function		Instruction
Input voltage range		22~26VDC
Recommended input voltage		24VDC
Max. power (U*I)	Relay full output	24*0.03=0.07W
	Main board control the chip to run	24*0.03=0.72W
	Optical coupling full input valid	24*0.13=3.12W
	Key light	14*24*0.03

10.1.3.2 Working environment:

Environment	Condition
Temperature	-10 degree $\sim$ +60 degree
Humidity	<80%
Soil fog	Soil fog: 0.13ug/m^3
Shock	Peak acceleration speed 100gn；100 times
Vibration	10Hz-100Hz 50 times；100Hz-10Hz 50 times
Sudden pulse group interference	2000V

10.1.4 Definition of the input/output interface

Serial No.	Pin	Terminal code	Terminal definition
1	J6	ATT	Attention
2	J7	PAS	Pass
3	J8	OL	Over Load
4	J9	DOL	Door Open limit
5	J10	DCL	Door Close limit
6	J11	SE	Safety Edge

Serial No.	Pin	Terminal code	Terminal definition
7	J4	V-, OB, V+, OBL	Opening button and light
8	J5	V-, CB, V+, CBL	Closing button and light
9	J12	LL	Light Load
10	J13	FL	Full Load
11	J14	RSE	Rear Safety Edge
12	J15	DS	Direction Selection Switch
13	J16	IND	Independent
14	J17	RDOL	Rear Door Open limit
15	J18	RDCL	Rear Door Close limit
16	J19	FRCL	Fire close limit
17	J23	26 pins	Extension interface of command board
18	J24	DJ1, V+, AJ1, V-	1 floor command
19	J25	DJ2, V+, AJ2, V-	2 floor command
20	J26	DJ3, V+, AJ3, V-	3 floor command
21	J27	DJ4, V+, AJ4, V-	4 floor command
22	J28	DJ5, V+, AJ5, V-	5 floor command
23	J29	DJ6, V+, AJ6, V-	6 floor command
24	J30	DJ7, V+, AJ7, V-	7 floor command
25	J31	DJ8, V+, AJ8, V-	8 floor command
26	J32	DJ9, V+, AJ9, V-	9 floor command
27	J33	DJ10, V+, AJ10, V-	10 floor command
28	J34	DJ11, V+, AJ11, V-	11 floor command
29	J35	DJ12, V+, AJ12, V-	12 floor command
30	J20/J21	DC, DO, DCM, RDO, RDC, RDCM	Opening/closing output DC—Door Close DO—Door Open DCM—COM Rear Open/Close Output RDC—Rear Door Close RDO—Rear Door Open RDCM—COM
31	J22	CHM, COM6, KLS, COM5, BK1, COM4,	CHM—Chime KLS—Light Saving

Serial No.	Pin	Terminal code	Terminal definition
		BK2, COM3	Arrival gang, lighting control
32	J1	CANH, CANL, 24V-, 24V+	Serial communication interface

10.1.5 Connection method

10.1.5.1 Car controller and the connection between the power supply and the communication bus

The power and communication of the car is brought in by J1.1-J1.4, of which, 24+, 24- are the communication wires of DC24V, CANH and CANL. The communication wires should be 4-core twist pairs.

Item	Requirement or remark
Usage	J1 is the serial communication interface connecting the engine room and the landing display controller
Connector type	VH-4 connector
Interface definition	4 pins 24+; 3 pins 24-; 2 pins CANL; 1 pin CANH
Connection wire requirement	Connect the 4-core twist pairs 24+ and 24- are a pair; CANH and CANL are a pair

The detailed connection:
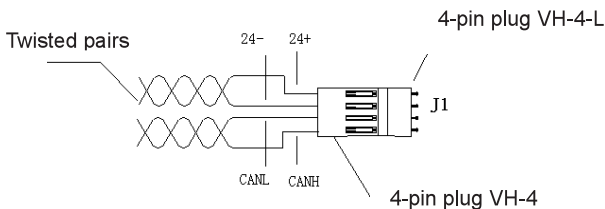
Figure 10-2 connection of the car main controller DC-01

10.1.5.2 Connection of the input signal of the car controller

Car controller mainly apply parts switch signals on the top of the car, in the car and at the bottom of the car and send these signal, such as attention, pass, overload, safety edge to the main controller.

10.1.5.3 Connection of the output signal of the car controller

The car controller controls the output of relay and transistor through the signal sent by main

controller. The output of relay controls the arrival prediction and light through controlling the relay of the station clock and light. The output of the transistor controls the output of the button light.

10.1.5.4 Connection of door button and indicator

Open door button   Open door button   Close door button   Open door light
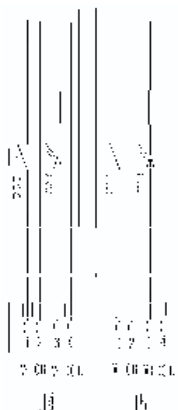
Figure 10-3 Connection of door button and indicator

10.1.6 Settings of configuration

Serial No.	Door operator and control box configuration	2-core pin of J2 near installation hole	RDO, RDC
1	Single control box and single door operator	No short-circuit	F0.09=0, F0.15=11, RDO and RDC can be the light of opening delay button
2	Single control box and dual door operator	No short-circuit	F0.09=1, RDO and RDC can be the opening/closing output of rear door
3	Dual control box and single door operator	No short-circuit	F0.09=0, F0.15 can defines RDO and RDC. By parallel connection, the buttons and lights of two control boxes can be coped with in the same way.
4	Dual control box and dual door operator	Rear door board in short-circuit	F0.09=0, F0.15 can defines RDO and RDC. By parallel connection, the buttons and lights of two control boxes can be coped with in the same way.

10.2 DC-02 command expander

10.2.1 Overall instruction

Add 1 command expander for each additional 8 floors when the floor is above 12th floor.

10.2.2 DC-02 interface instruction

10.2.2.1 Installation size
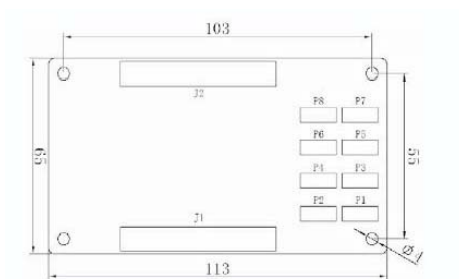
Figure 10-4 Installation size of the DC-02 command expander

Installation method:

1. Install when all power supplies are disconnected.

2. Fix with screws according to the installation holes.

3. Connect the terminals and tighten up.

Serial No.	Code	Name	Remark
1~8	P1~P8	Calling signal input and Registration instructions output terminal	XH-4 terminal
9	J1	Input connector of the command control bus	DC3-26PIN connector
10	J2	Output connector of the command control bus	DC3-26PIN connector

10.2.2.2 P1~P8 terminal function of the car I/O controller DC-02

Code	Instruction	Code	Instruction
①	Indicator output	③	Calling input
②	Positive pole of the power 24V	④	Negative pole of the power 24V

The first controller P1~P8 corresponds to the command record and indication of the 13~20 floor;

the second controller corresponds to the command record and indication of the 21~28 floor; the highest floor is the 64th floor.

10.2.2.3 Electrical specification of P1～P8 terminal in car I/O controller DC-02

Command I/O input

I/O input		Optical isolation Open circuit input
Current signal	"0" electrical level	0~2mA
	"1" electrical level	4.5~8mA
Voltage signal	"0" electrical level	18~24V DC
	"1" electrical level	0~5V DC
Signal digital filter delay		20mS
Signal response frequency		500Hz

Indicator I/O output

I/O output		Open collector output
Load voltage	DC	<30V DC
Load current	Resistor load	<100m A

10.2.3 Connection method

10.2.3.1 Connection of P1-P8 command button wires
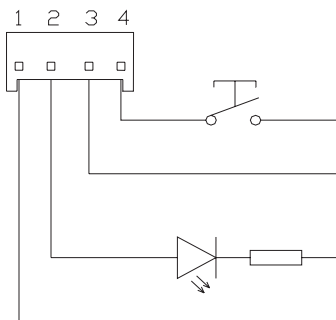
Figure 10-5 Connection of P1-P8 command button wires

P1-P8 of the car command board is connected to the command, P1 is connected to the command in 13 floor; P2 is connected to the command in 14 floor and so on. If the floor number is more than 20, then P1 on 2# command board is connected to the command in 21 floor. The command on the corresponding board is connected to the plug-ins, of which, 1 pin is connected to the power supply "－" of command indicator; 2 pin is connected to"＋" of the power supply and pin 3 and 4 are connected to buttons.

10.2.3.2 Connection method of P9 and P10

P9 is the connector of car controller. If the floor is high, the command board needs to be expanded. P9 of the sub-command board is connected with P10 of the upper command.

10.3 Calling displaying board DC-03A

DC-03A is used to receive calling and display the information of current floor and direction. The floor displaying board can work as the displaying board in the car.

To meet different requirements, there are various types of calling boards: DC-03A and DC-03B vertical lattice calling; DC-07A liquid vertical displaying board; DC-07H horizontal displaying board.

10.3.1 Installation size of DC-03A
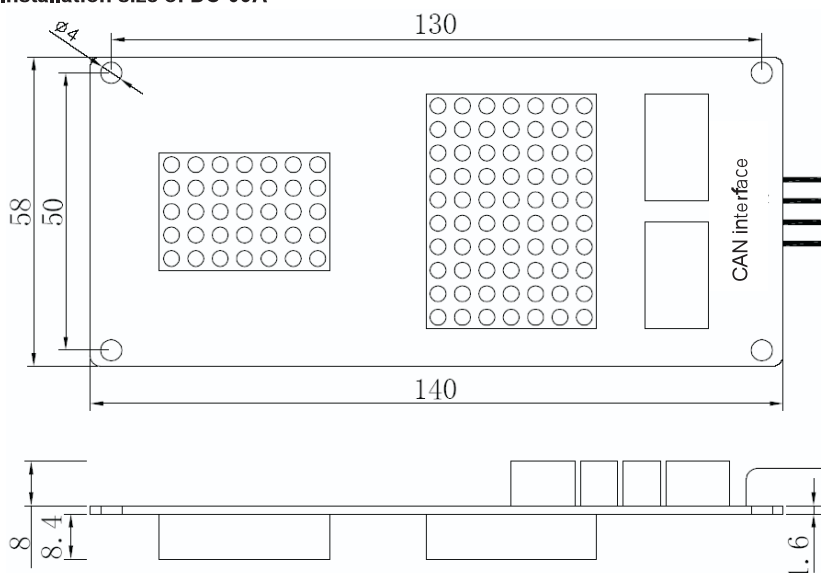
Figure 10-6 Installation size of calling displaying board DC-03A

Note	◆ The floor of the calling board cannot be set to 0.
	◆ It is recommended to use shield cables for the avoidance of interference.
	◆ Connect as the designated as tight as enough.

10.3.2 Parts instruction of calling displaying board DC-03A

Serial No.	Code	Terminal Definition	Instruction
1	P1	CANH, CANL, 24-, 24+	Power input and communication bus interface

Serial No.	Code	Terminal Definition	Instruction
2	P2	LU, V+, UP, V-	Up calling button and recording light
3	P3	LD, V+, UP, V-	Down calling button and recording light
4	P4	XF, V-	Fire signal
5	P5	LK, V-	Lock signal
6	D3	Running communication indicator	Off when normal communication Flickering when no communication
7	P6	Program download port	
8	P7	Spare function port	Direction light and arrival gong
9	J3	Across terminal of the communication terminator	Short circuit the corresponding J3 of the outside calling displaying board at the bottom floor and the displaying board in the car
10	J5	Across terminal of parameters setting	Short circuit : setting state Off: running state

Note: In P7, T0 landing up calling light, T1 landing down calling light, T2 landing arrival gong;

Function of arrival gong: when the elevator arrives in up direction, T2 will ring once for 1s; when the arrives in down direction, T2 will ring twice for 1s at the interval of 0.5s;

Function of landing light: T0 will flicker at the interval of 0.5s and stop when the door closes; T1 will flicker at the interval of 1s and stop when the door closes;

The current of T0, T1 and T2 should be limited in 200mA.

10.3.3 Communication interface of the calling displaying board DC-03A

10.3.3.1 P1 electrical interface of the calling displaying board DC-03A
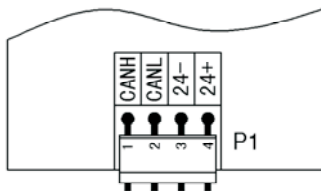
Figure 10-7 P1 electrical interface of DC-03A (terminal model: VH-4)

10.3.3.2 P1 terminal function of the calling displaying board DC-03A

Code	Instruction	Code	Instruction
①	Communication signal CANH	③	Negative pole of power 24V
②	Communication signal CANL	④	Positive pole of power 24V

10.3.4 P2~P5 terminal instruction of the calling displaying board DC-03A

10.3.4.1 Electrical connection of the calling displaying board DC-03A:
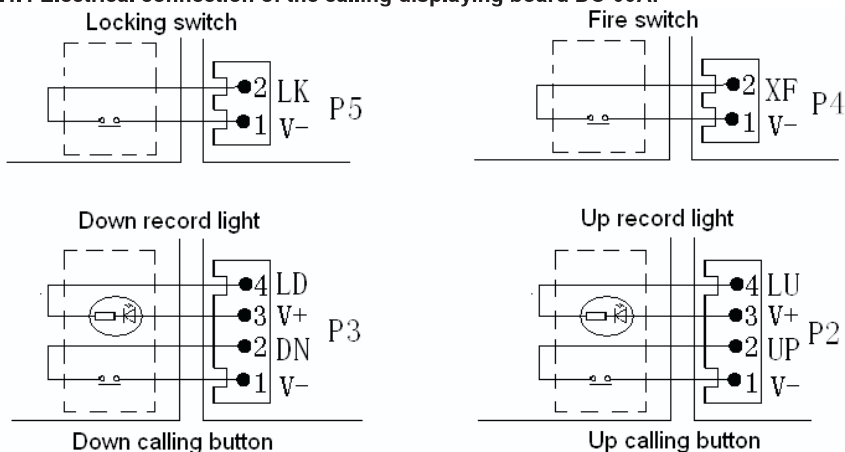
Figure 10-8 Electrical connection of the calling displaying board (terminal model of P2 and P3: XH-4; terminal model of P4 and P5: XH-2)

10.3.4.2 P2~P5 terminal function of the calling displaying board DC-03A

Code	Function	Remark
P2	Up calling button and recording light	
P3	Down calling button and recording light	
P4	Fire signal（XF）	
P5	Lock signal （LK）	

10.3.5 Electrical specification of P2～P5 terminal in calling displaying board DC-03A

10.3.5.1 Button switch input
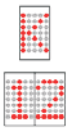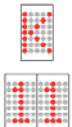
Input type		Optical isolation Open circuit input
Current signal	"0" electrical level	0~2mA
	"1" electrical level	4.5~8mA
Voltage signal	"0" electrical level	18~24V DC
	"1" electrical level	0~5V DC
Signal digital filter delay		20mS
Signal f response frequency		500Hz
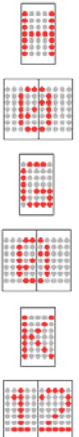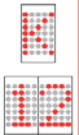
10.3.5.2 Indicator output

Output type		Open collector output
Load voltage	DC	<30V DC
Load current	Resistor load	<100m A

10.3.6 Parameters setting of calling displaying board DC-03A

10.3.6.1 Setting operation

Operation steps	Lattice displaying	Instruction
⑴:short circuit J5（SET）for 2 seconds and enter into the setting state		"K" is the code of the parameter of setting address "12" is the set address
⑵:UP button of the jogging calling; the setting parameter is increasing DOWN button of the jogging calling; the setting parameter is reducing		After the parameters modification, remove the tag and the parameter will save automatically.

Operation steps	Lattice displaying	Instruction
⑶:jogging P5 or P4, change the code for setting parameters: H→G→K cycle shifting		H：function selection G：spare function K：address of displaying board
⑷:remove J5（SET） to run normally, and then the setting is over.		Normal running displaying

10.3.6.2 Parameters setting of the calling displaying board

Code	Definition	Factory value
K	Address of the displaying board Range: 0~64	0
H	Function selection: lock enabling, fire enabling and arrow selection	0
G	Spare parameter	3

10.3.6.3 Address setting of the hall displaying board

If the hall displaying board is DC-03A, set the value of 'K' to corresponds to the floor number. That is, the K value of the bottom floor is 1 and the maximum cannot exceed 64.

When the button control of the back and front door is applied, the address of DC-03A board starts from K=33 and the maximum address can not exceed 64.

10.3.6.4 Address setting of the displaying board in car

If the displaying board in car is DC-03A, 'K' is set to '0'.

10.3.7 Function setting of the calling displaying board

10.3.7.1 Definition of 'H'

'H' is a hex data composing of 8 binaries. 4 low bit can be transformed into low hex bit and 4 high bit can be transformed into high hex bit. Below are the definitions:

Data (X stands for any data: 0 or 1)								Definition
7	6	5	4	3	2	1	0	
X	X	X	X	X	X	X	1	Lock enabling, the lock signal act when the 0 position is 1
X	X	X	X	X	X	1	X	Fire enabling, fire signal act when the 1 position is 1
X	X	X	X	X	1	X	X	Arrow enabling, the arrow displays the state when the 2 position is 1
X	X	X	X	1	X	X	X	Inspection displaying enabling, the inspection state displays JX when the 3 position is 1

10.3.7.2 Lock enabling setting

Set lock enabling to be '1', the elevator is running automatically and when the lock signal close, the floor displaying outside the elevator is off, but the displaying in car is normal. When the elevator returns to the stopping floor and the door is closed, the elevator is locked.

10.3.7.3 Fire enabling setting

Set the fire safety enabling to be '1', when the fire signal is off and the elevator is running, the elevator will be in the fire running state.

Note: the lock enabling and fire enabling is only one valid at the outside calling controller of the elevator, but the can be set on different outside calling controller.

10.3.7.4 Arrow enabling setting

Set the arrow enabling to be '1', then the elevator will display in thin rolling arrow; set the arrow enabling to be '0', then the elevator will display in thick rolling arrow.

10.3.8 Displaying table of elevator state
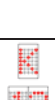
Displaying in car				
Station prediction: no				
Inspection	☑ normal displaying	☐ abnormal displaying	☐special characters or other mode	Display floor number and leveling mark when inspection in leveling; Display floor number when inspection not in leveling
Power off Leveling	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Independent	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Fire	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Safety circuit off	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Lock	☐ normal displaying	☐ no displaying	☑ special characters or other mode	
Fault	☐ normal displaying	☐ no displaying	☑ special characters or other mode	
Overload	☐ normal displaying	☐ no displaying	☑ special characters or other mode	Display "OL"
Attendant	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Full load	☑ normal displaying	☐ no displaying	☐ special characters or other mode	

Displaying outside the hall			
Station prediction: no			
Inspection	☐ normal displaying	☐ no displaying	☑ special characters or other mode
Power off Leveling	☑ normal displaying	☐ no displaying	☑ special characters or other mode

Displaying outside the hall			
Station prediction: no			
Independent	☐ normal displaying	☑ no displaying	☐ special characters or other mode	
Fire	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Safety circuit off	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Lock	☐ normal displaying	☑ no displaying	☐ special characters or other mode	
Fault	☐ normal displaying	☑ no displaying	☐ special characters or other mode	
Overload	☑ normal displaying	☐ no displaying	☐ special characters or other mode	
Attendant	☐ normal displaying	☐ no displaying	☑ special characters or other mode	1[F],2/3 normal displaying
Full load	☐ normal displaying	☐ no displaying	☑ special characters or other mode	1[F],2/3 normal displaying

10.3.9 Displaying pictures

Serial No.	Picture	Meaning
1		Displaying in the inspection car "=" means the elevator is in the leveling position of 12th floor
2		Displaying outside the car means the inspection state
3		Displaying outside the car "F" means the elevator is full running
4		Monitor inside the car "OL" means overload

5		Up arrow means the elevator is going to go up. Rolling arrow means the elevator is going up. The quicker the rolling speed is, the faster the elevator is running.
6		Down arrow means the elevator is going to go down. Rolling arrow means the elevator is going down. The quicker the rolling speed is, the faster the elevator is running.
7		The monitor is in the state of floor setting.
8		The monitor is in the state of multiple-function displaying.
9		"V" means the version of the elevator. 12 means version 1.2. Display when power on.
10		The elevator is locked.

10.3.10 Connection method

10.3.10.1 Connection between the displaying board, power supply and the communication bus
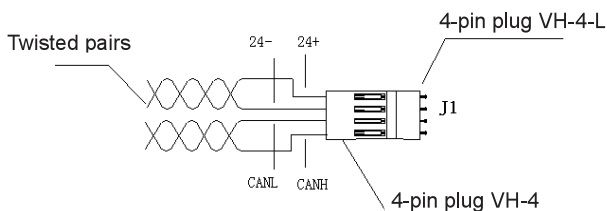
Figure 10-9 connection method

The power supply and communication of the displaying board is brought in by 4-hole plug, of which, 1 pin is 24+; 2 pins are 24-; input power supply is DC24V; 3 pins are CANL; 4 pins are CANH. The communication wires are twisted pairs.

10.3.10.2 Installation requirement

▷ Do not install on the combustible materials, otherwise fire may occur.

▷ Keep away from combustible items, otherwise fire may occur.

▷ Do not install in the environment with explosive gas, otherwise fire may occur.

➢ Do not remove any part on the protective plate. The plate is designed to protect all parts.

➢ Do not put any force on the cover and panel; otherwise damage may occur to the controller.

➢ Do not install in the situation with water drops, otherwise damage may occur to the controller.

➢ Do not drop any metal objects, such as screw into the controller, otherwise, damage may occur to the controller.

10.4 Instruction of DC-03B

DC-03B is ultra-thin lattice display. The floor setting, corresponding function of identification defined by pins are the same as DC-03A.

10. 4.1 Installation dimension of DC-03B
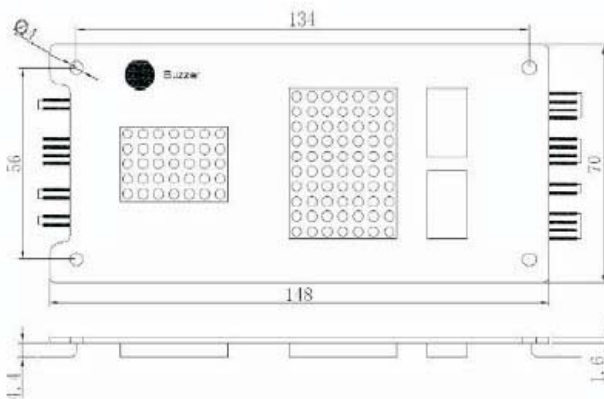
Figure 10-10 Installation dimension of DC-03B

Note	◆ The floor of the calling board cannot be set to 0. ◆ It is recommended to use shield cables for the avoidance of interference. ◆ Connect the terminal as designated as tight as enough. ◆ The function of DC-03B is the same as that of DC-03A except the "bee alarm". The wiring connection of DC-03B adopts 2510R-4P (2.54mm) and 2510R-42(2.54mm).

10.4.2 Definition of 'H'

'H' is a hex data composing of 8 binaries. 4 low bit can be transformed into low hex bit and 4 high bit can be transformed into high hex bit. Below are the definitions:

Data (X stands for any data: 0 or 1)								Definition
7	6	5	4	3	2	1	0	
X	X	X	X	X	X	X	1	Lock enabling, the lock signal act when the 0 position is 1
X	X	X	X	X	X	1	X	Fire enabling, fire signal act when the 1 position is 1
X	X	X	X	X	1	X	X	Arrow enabling, the arrow displays the state when the 2 position is 1
X	X	X	X	1	X	X	X	Inspection displaying enabling, the inspection state displays JX when the 3 position is 1
X	X	X	1	X	X	X	X	Buzzer prompt enabling, the buzzer prompt act when the 4 position is 1

Note: H=10, the buzzer will prompt enabling. In up recording, the buzzer prompts once and in down recording, it prompts twice.

10.5 Instruction of DC-07A/B

DC-07A/B is the segment vertical LCD. The floor setting, pin definition and parameters setting are as follows.

10.5.1 Installation dimension of DC-07A
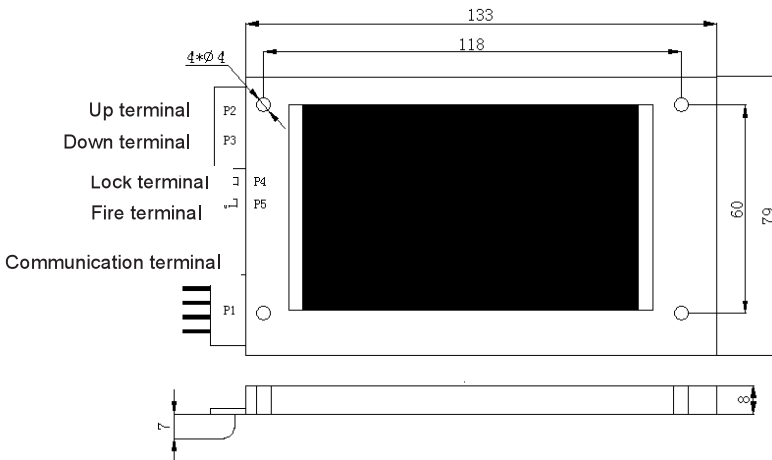
Figure 10-11 Installation dimension of DC-07A

Note	◆ The floor of the calling board cannot be set to 0.
	◆ It is recommended to use shield cables for the avoidance of interference.

	◆ Connect the terminal as designated as tight as enough.
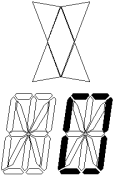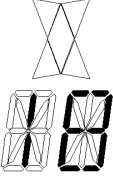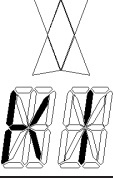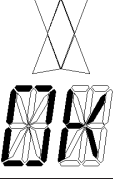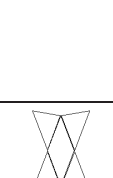
10.5.2 Parts instruction of DC-07A

Serial No.	Code	Terminal Definition	Terminal Model	Instruction
1	P1	CH, CL, GND, 24V+	VH-4	Power input and communication bus interface
2	P2	L0, V+, UP, V-	XH-4	Up calling button and recording light
3	P3	L1, V+, DN, V-	XH-4	Down calling button and recording light
4	P4	LK, V-	XH-2	Lock signal interface
5	P5	FR, V-	XH-2	Fire signal interface
6	P6	RUN, SET	Single pin 1*3	Across terminal of parameters setting
7	P7	Arrival gong/light port	XH-5	T0/T1 arrival light, T2 arrival gong
8	J1	CAN	Single pin 1*2	Across terminal of communication terminal resistance

10.5.3 Instruction of DC-07A parameters setting

10.5.3.1 Setting operation

Operation steps	LED displaying	Instruction
(1):short circuit P6（SET 2 pins）, D13 CAN indicator off, then enter into the setting state	K1	Setting range:K1-K9 K1 represents the set address
(2):in menu bar state, jogging UP and V- of P2, the menu bar is increasing; jogging DN and V- of P3, the menu bar is reducing	K6	Setting range:K1-K9

Operation steps	LED displaying	Instruction
(3):in a certain menu, short circuit LK and V- of P4 and enter into the setting state; the parameter is flickering simultaneously		0 represents the parameter
(4):in setting state, jogging UP and V- of P2, the parameter is increasing; jogging DN and V- of P3, the parameter is reducing		The parameter after modification
(5) :after setting, short circuit FR and V- of P5 and exit the setting		Display current menu
(6): short circuit RUN of P6, then exit and save the setting. If the parameter saving is correct, display OK.		OK indicates successful setting
(7):if the parameter is not changed, enter into normal running		
(8) :reset to run normally, and then the setting is over.		Normal running displaying

10.5.3.2 Instruction of parameters

Code	Value	Instruction
K1	XX	Corresponding to the actual floor; the bottom floor is 1 and the maximum value cannot exceed 64
	0	Displaying board in the car

K2	0	Lock elevator is not enabled and the signal input is invalid
	1	Lock elevator enabling and the signal input valid; when the calling lock screen is black, display LK and stop, no response to calling.
K3	0	Fire is not enabled and the signal input is invalid
	1	Fire enabling and the signal input valid; when the calling fire signal is back home landing, display current floor, no response to calling.
K4	0	In running, the arrow flickers
	1	In running, the arrow does not flicker
K5	0	No display on fire outside
	1	Display on fire outside
K6	0	When the external calling inspection screen is black, display current floor and stop; the internal calling inspection displays current floor (stop) and rhombus
	1	The external calling inspection displays current floor and stop; the board in the car displays current floor (stop) and rhombus
K7	0	Lock normally opened
	1	Lock normally closed
K8	0	Fire normally opened
	1	Fire normally closed
K9	0	"Stop" and "Full load" in Chinese
	1	The state displays English mode

10.5.4 Installation dimension of DC-07B
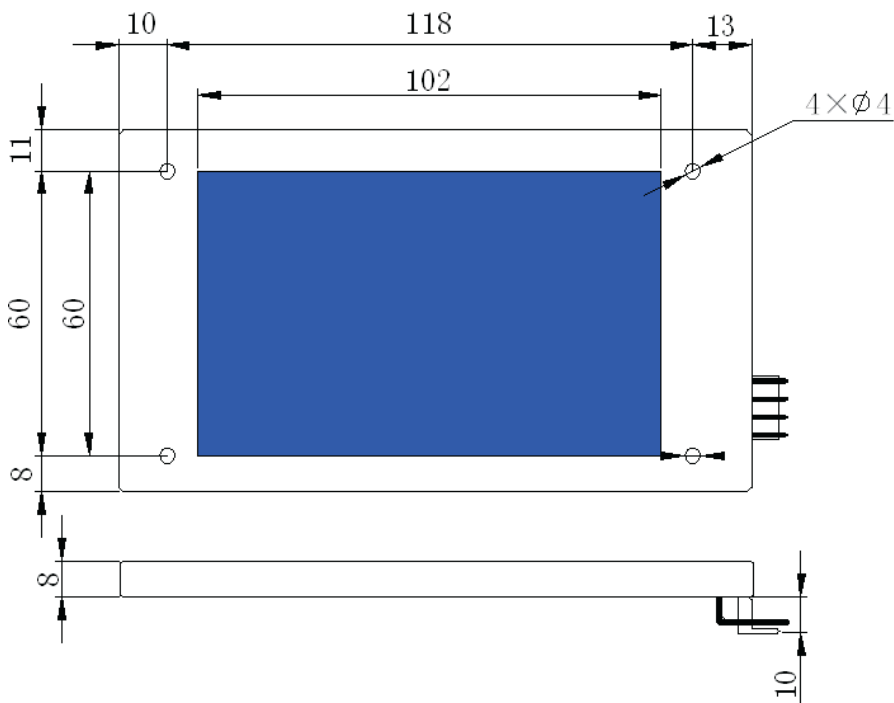
Figure 10-12 Installation dimension of DC-07B

Model	Shape dimension (mm)	Installation dimension (mm)	Hole size (mm)
DC-07B	141×79	118×60	Φ4

10.5.5 Parts instruction of DC-07B

Serial No.	Code	Terminal Definition	Terminal Model	Instruction
1	P1	CANH, CANL, 24V-, 24V+	VH-4	Power input and communication bus interface
2	P2	L0, V+, UP, V-	XH-4	Up calling button and recording light

Serial No.	Code	Terminal Definition	Terminal Model	Instruction
3	P3	L1, V+, DN, V-	XH-4	Down calling button and recording light
4	P4	V-, LK	XH-2	Lock signal interface
5	P5	V-, FR	XH-2	Fire signal interface
6	P6	SWIM, RST, 5V, SET, RUN(TXD), TXD3, RD3, NC, GND, GND	DC3-10	Software program input port and across terminal of parameters setting
7	P7	V+, T0, T1, T2, V-	XH-5	Reserved for arrival light and arrival gong
8	J1	CAN	Single pin 1*2	Across terminal of communication terminal resistance

10.5.6 Instruction of DC-07B communication interface
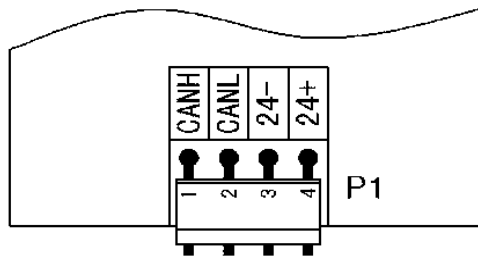
Figure 10-13 P1 electrical interface of DC-07B (terminal model: VH-4)
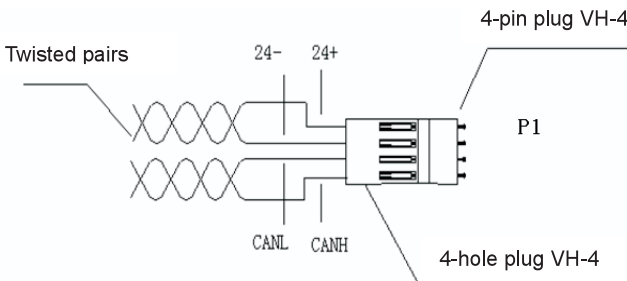
Figure 10-14 Connection method

10.5.7 Instruction of DC-07B communication interface

Code	Instruction	Code	Instruction
①	Communication signal CANH	③	Negative pole of power 24V
②	Communication signal CANL	④	Positive pole of power 24V

10.5.8 P2~P5 terminal instruction of DC-07B
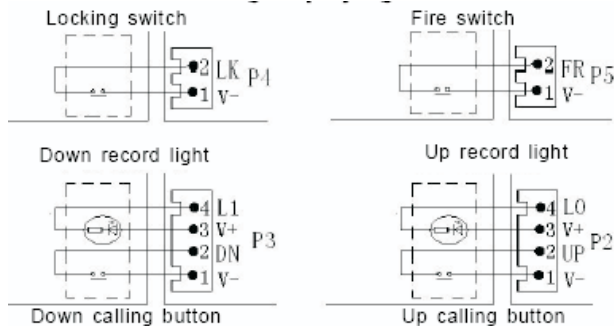
Figure 10-15 Electrical connection of the calling displaying board (terminal model of P2 and P3: XH-4; terminal model of P4 and P5: XH-2)

10.5.9 P2~P5 terminal function of DC-07B

Code	Function	Remark
P2	Up calling button and recording light	
P3	Down calling button and recording light	
P4	Lock signal （LK）	
P5	Fire signal（XF）	

10.5.10 Electrical specification of P2～P5 terminals
Button switch input

Input type		Optical isolation Open circuit input
Current signal	"0" electrical level	0~2mA
	"1" electrical level	1.5~8mA
Voltage signal	"0" electrical level	18~24V DC
	"1" electrical level	0~5V DC
Signal digital filter delay		20mS
Signal f response frequency		500Hz

Indicator output

Output type		Open collector output
Load voltage	DC	<30V DC
Load current	Resistor load	<100m A

10.5.11 Instruction of multi-function P6 terminal
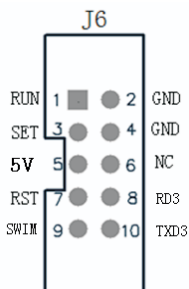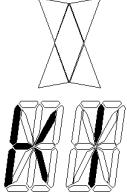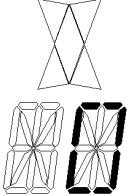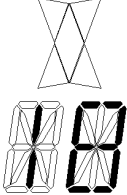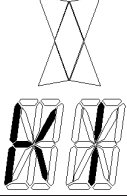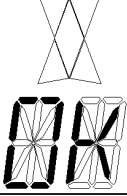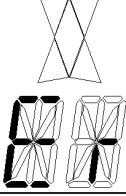
Figure 10-16 Diagram of multi-function terminal J6

10.5.12 Definition of multi-function P6 terminal
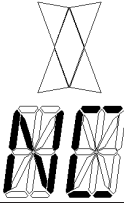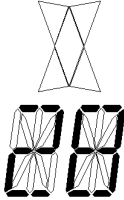
Code	Definition
①②	Short circuit two terminals and enter into normally displaying state
③④	Short circuit two terminals for 2s and enter into the setting state
⑤	MF output terminal of power supply 5V
②④	MF output terminal of power supply 0V
⑦	Reset terminal
Other	Not connected

10.5.13 Parameters setting of DC-07B
Setting operation

Operation steps	LED displaying	Instruction
(1):short circuit ③④ terminals of P6 for 2s and then enter into the setting state		K1 represents the set address

Operation steps	LED displaying	Instruction
(2):in menu bar state, jogging UP and V- of P2, the menu bar is increasing; jogging DN and V- of P3, the menu bar is reducing	KI	K1-K9 represent individual function
(3):in a certain menu, short circuit LK and V- of P4 and enter into the setting state; the parameter is flickering simultaneously	0	0 represents the parameter
(4):in setting state, jogging UP and V- of P2, the parameter is increasing; jogging DN and V- of P3, the parameter is reducing	18	The parameter after modification
(5) :after setting, short circuit FR and V- of P5 and exit the setting	KI	Display current menu
(6) :short circuit ①② terminals of P6, then exit and save the setting. If the parameter saving is correct, display OK.	OK	OK indicates successful setting
(7):if the parameter saving error	Er	OK indicates setting fault

Operation steps	LED displaying	Instruction
⑻:if the parameter is not changed	*NC*	NC indicates the parameter is not changed
⑼:reset to run normally, and then the setting is over.	*28*	Normal running displaying

10.5.14 Instruction of parameters

Code	Value	Instruction
K1	XX	Corresponding to the actual floor; the bottom floor is 1 and the maximum value cannot exceed 64
	0	Displaying board in the car
K2	0	Lock elevator is not enabled and the signal input is invalid
	1	Lock elevator enabling and the signal input valid
K3	0	Fire is not enabled and the signal input is invalid
	1	Fire enabling and the signal input valid
K4	0	In running, the arrow flickers
	1	In running, the arrow does not flicker
K5	0	Car board and calling board display fire information
	1	Car board and calling board display fire information
K6	0	The car board displays current floor and inspection; the calling board displays inspection
	1	The car board displays current floor and inspection; the calling board displays inspection
K7	0	Lock normally opened
	1	Lock normally closed
K8	0	Fire normally opened
	1	Fire normally closed
K9	0	"Inspection" "Fire" "Overload" "Full load" in Chinese

	1	The state displays English mode

10.5.15 Address setting of the hall displaying board

If DC-07B is hall displaying board, set 'K' corresponding to floors. That is, the K value of the bottom floor is 1 and the maximum cannot exceed 64.

10.5.16 Address setting of the displaying board in car

If DC-07B is the displaying board in car, set the address 'K1' to 0.

10.5.17 Lock enabling setting

Set lock enabling 'K2'to be '1', the elevator is running automatically and when the lock signal close, the floor displaying outside the elevator is off. At calling, the calling board displays "LK" and "Inspection" while displaying in car is normal. When the elevator returns to the stopping floor and the door is closed, the elevator is locked.

10.5.18 Fire enabling setting

Set the fire safety enabling "K3" to be '1'. When the elevator is running and the fire signal closes, the elevator will be in the fire running state.

Note	◆ The lock enabling and fire enabling is only one valid at the outside calling controller of the elevator, but the can be set on different outside calling controller.

10.5.19 Safety precautions of DC-07B installation

➢ Mount the device on nonflammable material and keep away from any explosives and inflammable items, or fire and explosion may occur.

➢ Do not remove the protective cover, or damage to the parts may occur.

➢ Do not make the cover and panel under stress, or damage to the controller may cause.

➢ The installation position should be free of dripping water or other liquids. Or damage may occur.

➢ Make sure no screws, washers or other metal bars can stick on the displaying board, or damage to the controller may cause.

Note	◆ The floor of the calling board cannot be set to 0.
	◆ It is recommended to use shield cables for the avoidance of interference.
	◆ Connect as the designated as tight as enough.

10.6 Instruction of DC-07H

DC-07H is the segment horizontal LCD. The floor setting, pin definition and parameters setting are as follows:

10.6.1 Installation dimension of DC-07H
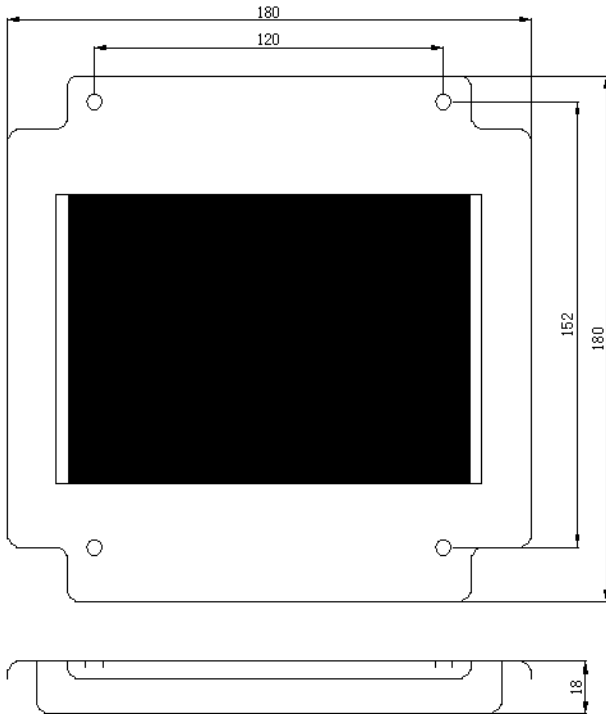
Figure 10-17 Installation dimension of DC-07H

Note	◆ The floor of the calling board cannot be set to 0.
	◆ It is recommended to use shield cables for the avoidance of interference.
	◆ Connect as the designated as tight as enough.

10.6.2 Parts instruction of DC-07H

Serial No.	Code	Terminal definition	Terminal model	Instruction
1	JP1	P+, GND, CANH, CANL	CH3.96-4	Power input and communication bus interface
2	JP3	1(L0), 2(V+), 3(UP), 4(V-)	2510R-4P	Up calling button and recording light
3	JP4	2(L1), 2(V+), 3(DN), 4(V-)	2510R-4P	Down calling button and recording light
4	JP5	1(NC), 2(NC),	2510R-4P	Lock signal

		3(LK),4(V-)		
5	SW1	The dial switch has 2 buttons. Switch No.1 button to ON to enter into the menu of function parameters. Switch No.2 button to KE to act as CAN communication terminal resistance.		

10.6.3 Parameters setting of DC-07H

10.6.3.1 Setting operation

Connect the communication bus at JP1 interface at first. After the LCD is on, switch No.1 to ON and No.2 to KE. Wait for 2s, and then enter into K1 options. Jogging 3 and 4 of JP3, K1 turns to forward (K1/K2/K3/K4/K5); Jogging 3 and 4 of JP4, K1 turns to backward (K1/K5/K4/K3/K2/K1). After menu code selection, Jogging 3 and 4 of JP5, then enter into the function options of the selected menu. The factory setting is 0 and the value begins flickering after jogging. Repeat jogging 3 and 4 of JP3 or JP4 to set the parameters. Exit K menu by jogging 3 and 4 of JP5. Then switch No.1 to OFF. OK means successful parameters setting and entering into running state.

10.6.3.2 Instruction of parameters

Code	Value	Instruction
K1	XX	Corresponding to actual floors, the bottom floor is 1 and the maximum value cannot exceed 64
	0	Displaying board in car
K2	0	Lock elevator is not enabled and the signal input is invalid
	1	Lock elevator enabling and the signal input valid
K3	0	K3=0, the arrow flickers
	1	K3=1, the arrow does not flicker
K4	0	K4=0, lock normally opened
	1	K4=1, lock normally closed
K5	0	K5=0, "Overload" "Leave" in Chinese
	1	K5=1, the state displays English mode

10.7 Instruction of EC-CTB

EC-CTB is the main control board of EC100, including 9 digital signal inputs, 1 analog voltage signal input, 5 relay normally-open signal outputs and 1 relay normally-open/closed signal output. It also has 2 digital signal I/O terminals to communicate with EC-CCB, the terminals to carry on CAN communication for EC100 and the displaying board in car, and RS232 communication with upper computer. It is important for the signal collection and output of EC100 controller.

10.7.1 Installation dimension of EC-CTB
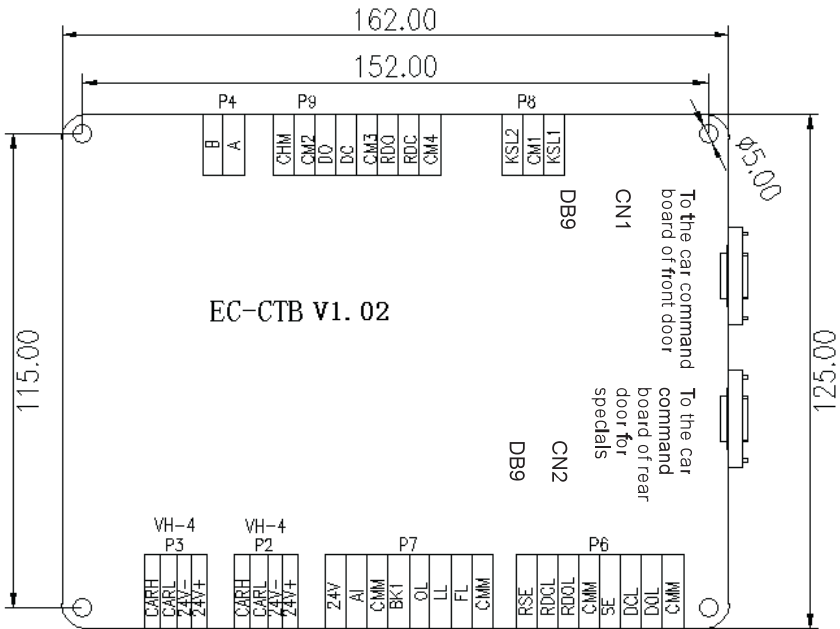
Figure 10-18 Installation dimension of EC-CTB

Installation method:

1. Install when all power supplies are disconnected.

2. Fix with screws according to the installation holes.

3. Connect the terminals and tighten up.

10.7.2 Interface definition

Serial No.	Pin	Interface	Definition
1	P1	4-core terminal	Download port of J-link
2	P2	24+,24-,CANH2,CANL2	CAN communication interface
3	P3	24+,24-,CANH1,CANL1	CAN communication interface
4	P4	A, B	RS485 communication interface
5	P5	8-core terminal	Download port of serial software
6	P6	RSE, RDCL, RDOL, CMM; SE, DCL, DL, DOL, CMM	Rear door beam, close/open signal of rear door Front door beam, close/open signal of front door

Serial No.	Pin	Interface	Definition
7	P7	24V, AI, CMM; BK1, OL, LL, FL, CMM	24V and CMM provide DC24 power; AI and CMM are 0~10V input; BK1 is the spare input; OL is the overload input; LL is the light load input and FL is the full load input
8	P8	KLS1, CM1, KSL2	KLS1 and CM1 are the NC contact of energy control; KLS2 and CM1 are the NO contact of energy control
9	P9	CHM, CM2, DO, DC, CM3, RDO, RDC, CM4	CHM and CM2 are the arrival control; DO, DC and CM3 are the front door open/close control; RDO, RDC and CM4 are the rear door open/close control
10	CN1	DB9 (female)	CN1 port connects the internal command board
11	CN2	DB9 (female)	CN1 port connects the internal command board (for the command button of the rear door)

10.7.3 DIP instruction

Serial No.		
J1	1	Switch to "ON" when use external protocol. Switch to "OFF" in factory.
	2	Switch to "ON" and the terminal resistor is valid. Switch to "OFF" in factory.

Note	◆ It is recommended to use shield cables for the avoidance of interference. Avoid parallel cable routine. ◆ Use 9-core cables to connect the car board and command board. ◆ It is better to use shield cables as the communication wires.

◆	Connect the terminal as designated as tight as enough.

10.7.4 Settings of configuration

Serial No.	Door operator and control box configuration	BK1 terminal	DOD, RAS (F0.09=0)
1	Single control box and single door operator	Not connect	F0.15=11, DOD and RAS can be the light of opening delay button
2	Single control box and dual door operator	Not connect	F0.15=1, DOD is the opening light of rear door. Connect 4 pins of J19-DOD to 4 pins of J17, and RAS is the light of opening delay button
3	Dual control box and single door operator	Short circuit CMM	The buttons and lights of two control boxes can be coped with in the same way.
4	Dual control box and dual door operator	Not connect	DOD and RAS of front door can be multi-function output.

10.8 Instruction of EC-CCB

EC-CCB is the auxiliary command board of EC100 in the controller of EC100. Each board has 24 input and 22 output terminals, including 16 floor buttons and 8 function signals. It is mainly used for the signal collection and output of buttons and lights.

10.8.1 Installation dimension of EC-CCB
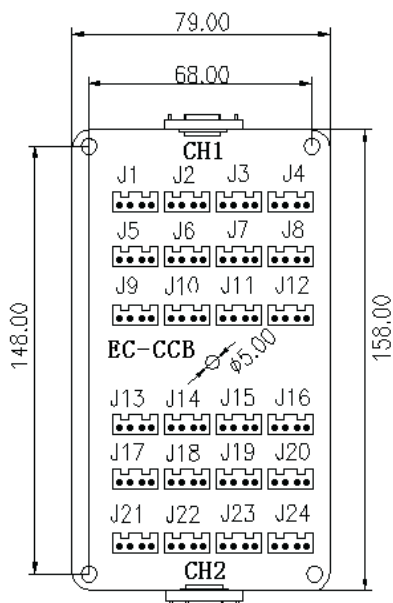
Figure 10-19 Installation dimension

10.8.2 Interface definition

Serial No.	Pin	Interface	Definition	Remark
1	CH1	DB9(male)	CH1 connects the car top board	
2	CH2	DB9(female)	CH2 connects the internal command board	
3	J1	V+,K, V+,L-	Button input of floor 1	
4	J2	V+,K, V+,L-	Button input of floor 2	
5	J3	V+,K, V+,L-	Button input of floor 3	For command
6	J4	V+,K, V+,L-	Button input of floor 4	board 2, Jn
7	J5	V+,K, V+,L-	Button input of floor 5	input signal
8	J6	V+,K, V+,L-	Button input of floor 6	corresponds
9	J7	V+,K, V+,L-	Button input of floor 7	to the input of
10	J8	V+,K, V+,L-	Button input of floor 8	(16+n) button

11	J9	V+,K, V+,L-	Button input of floor 9	The 2nd board
12	J10	V+,K, V+,L-	Button input of floor 10	can expands
13	J11	V+,K, V+,L-	Button input of floor 11	20 floor
14	J12	V+,K, V+,L-	Button input of floor 12	commands
15	J13	V+,K, V+,L-	Button input of floor 13	
16	J14	V+,K, V+,L-	Button input of floor 14	
17	J15	V+,K, V+,L-	Button input of floor 15	
18	J16	V+,K, V+,L-	Button input of floor 16	
4	J17/OBL	V+,K, V+,L-	Button input of door open	
5	J18/CBL	V+,K, V+,L-	Button input of door close	
6	J19/DOD	V+,K, V+,L-	Button input of door open delay	
7	J20/PAS	V+,K, V+,L-	Button input of drive	
8	J21/ATT	V+,K, null, null	Button input of attendant	Invalid for
9	J22/DS	V+,K, null, null	Button input of direction change	command board 2
10	J23/IND	V+,K, null, null	Button input of separate running	
11	J24/FRCL	V+,K, null, null	Button input of fire switch	

Note	◆ It is recommended to use shield cables for the avoidance of interference. Avoid parallel cable routine. ◆ Use 9-core cables to connect the car board and command board. ◆ Connect the terminal as designated as tight as enough.

10.8.3 Car command button and connection of the indicators
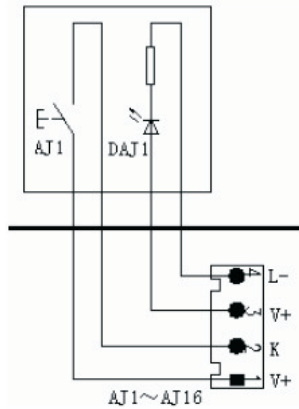
Figure 10-20 Car command button and connection of the indicators

10.8.4 Car open button and connection of the indicators
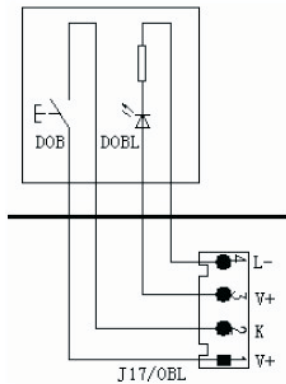
Figure 10-21 Car open button and connection of the indicators

10.8.5 Car close button and connection of the indicators
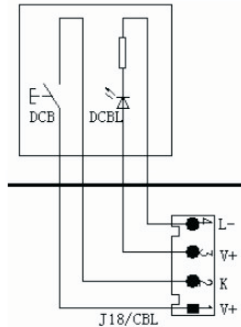
Figure 10-22 Car close button and connection of the indicators

10.9 Instruction of MC-GCL

The group control board MC-GCL and elevator intelligent integration EC100 make up the distributed control system DCS. By CAN communication, collect internal/external calling recording signals of each elevator. After intelligent processing, allocate the information to corresponding elevator to control 8-64 elevators under high efficiency. Functions of DCS are:

1. Adaptive up in rush hour: when the group control board identifies rush hours, all elevators will provide service according to up calling priority. After rush hours, change into balanced mode automatically.

2. Adaptive down in rush hour: when the group control board identifies rush hours, one elevator will provide service for up calling and the other elevators will provide service for down calling, responding to down calling as soon as possible. After rush hours, change into balanced mode automatically.

3. Timing up in rush hour: in the set time, all elevators provide service according to up calling priority.

4. Timing down in rush hour: in the set time, all elevators provide service according to down calling priority.

5. Timing zoning running: in the set time, the specified elevators will only stop at allocated floors and prompt passengers by sound and light according to setting, achieving high speed, efficiency and reducing stop as much as possible.

6. Balanced mode: respond to the calling command according to the shortest time

7. Free mode: in balanced mode, when there is no calling in the set time, elevators will wait for commands at the 1st floor in the specified zone to respond to calling as fast as possible.

MC-GCL adopts 32-bit ARM chip, four layers mounted at the surface and CAN bus serial communication, highly intelligent and reliable. It also has the manual keypad for operation and

LCD interface for debugging.

10.9.1 Installation dimension
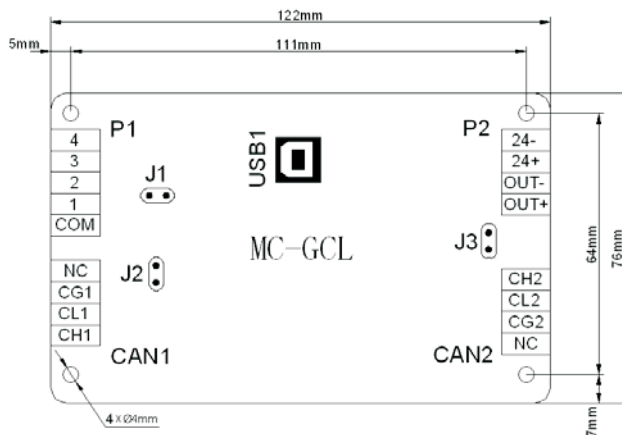
Figure 10-23 Installation dimension

Installation method:

1. Install when all power supplies are disconnected.

2. Fix with screws according to the installation holes.

3. Connect the terminals and tighten up.

10.9.2 Configuration

Name	Function	Qty.	Position
MC-GCL	For group control	One for each elevator	In control cabinet

10.9.3 Specification of the connectors

Serial No.	No	Model
1	CAN1, CAN2, P2	2EHDRC-4P
2	P1	2EHDRC-5P
3	J1, J2, J3	SIP2 (pin 2.54mm)
4	CN1	180° B USB female

10.9.4 Electrical specifications

10.9.4.1 Board specifications:

Name	MC-GCL
Color	Blue
Thickness	1.6mm
Layers of layout	4

10.9.4.2 Power supply specifications:

Input voltage range	DC22V~DC26V	
	Main board control the chip to run	1.6W
	Optical coupling (4) full input valid	0.6W

10.9.4.3 Low-voltage switch specifications:

Input point	4	
Input manner	4 common cathode collector open input	
Input voltage threshold	Absolute turn-on threshold	≤ 6V
	Absolute turn-off threshold	≥ 18 V
Recommended valid input voltage	0V	
Max. current	20mA	

10.9.4.4 Communication interface:

Interface	Manner	Function
CAN1	CAN BUS	Define group control interface communication along with EC100
CAN2	CAN BUS	Communicate with the group control board

10.9.4.5 Working environment:

Temperature	0 degree ~ 70 degree
Humidity	<95%
Soil fog	0.13ug/m3
Shock	Peak acceleration speed 100gn, 100 times
Vibration	10Hz-100Hz 50 times 100Hz-10Hz 50 times
Sudden pulse group interference	2.5KV

10.9.5 Definition of the input/output interface

10.9.5.1 Definition of power supply interface

Serial No.	Pin	I/O	Definition	Remark
P2	24-	Input	DC0V input terminal	

	24+	Input	DC24V+ input terminal	
	OUT-	Output	DC0V power supply interface for outside	
	OUT+	Output	DC24V+ power supply interface for outside	

10.9.5.2 Definition of CAN communication interface

Serial No.	Pin	I/O	Definition	Remark
CAN1	CH1	Output	Communicate with EC100 H terminal	Twisted pairs for external connection
	CL1	Output	Communicate with EC100 L terminal	
	CG1	Output	Grounding terminal of CAN1	Not grounded generally
	NC	Output	Not connected	
CAN2	CH2	Output	Communicate with MC-GCL H terminal	Twisted pairs for external connection
	CL2	Output	Communicate with MC-GCL L terminal	
	CG2	Output	Grounding terminal of CAN2	Not grounded generally
	NC	Output	Not connected	

10.9.5.3 Definition of I/O terminal

Serial No.	Pin	I/O	Definition	Corresponding LED
P1	COM	Input	1, 2, 3 and 4 pins input common terminals	—
	1	Input	Not defined	L4
	2	Input	Not defined	L3
	3	Input	Not defined	L2
	4	Input	Not defined	L1

10.9.6 Electrical specifications

Serial No.	Definition of pin	Remark
J1	Short circuit the connector in serial download software mode	Not short circuit
J2	Short circuit pin between group control board and CAN communication terminal resistance defined on EC100-I/O board; in short circuit, resistance about 120Ω, if not, communication resistance open circuit	Default short circuit
J3	Short circuit pin between group control board and CAN communication terminal resistance; in short circuit, resistance about 120Ω, if not, communication resistance open circuit	Default short circuit; on site, 2 farthest J3 need short circuit while other J3 unnecessary.

10.9.7 Instruction of LED

Name	Instruction
LED1	When no communication is at CAN1, LED1 will be on at the interval of 0.5s; when communication at CAN1 is normal, LED1 will flicker continuously.
LED2	When no communication is at CAN1, LED2 will be off; when communication at CAN1 is normal, LED2 will flicker continuously.
LED3	When no communication is at CAN2, group number is 3 (No.1 elevator) and LED3 is on at the interval of 0.5s; when communication at CAN2 is normal, group number is 3 (No.1 elevator) and LED3 flickers continuously (in group control dispatch).
LED4	When no communication is at CAN2, group number is 4 (No.2 elevator) and LED4 is on at the interval of 0.5s; when communication at CAN2 is normal, group number is 4 (No.2 elevator) and LED4 flickers continuously (in group control dispatch).
LED5	When no communication is at CAN2, group number is 5 (No.3 elevator) and LED5 is on at the interval of 0.5s; when communication at CAN2 is normal, group number is 5 (No.3 elevator) and LED5 flickers continuously (in group control dispatch).

LED6	When no communication is at CAN2, group number is 6 (No.4 elevator) and LED6 is on at the interval of 0.5s; when communication at CAN2 is normal, group number is 6 (No.4 elevator) and LED6 flickers continuously (in group control dispatch).
LED7	When no communication is at CAN2, group number is 7 (No.5 elevator) and LED7 is on at the interval of 0.5s; when communication at CAN2 is normal, group number is 7 (No.5 elevator) and LED7 flickers continuously (in group control dispatch).
LED8	When no communication is at CAN2, group number is 8 (No.6 elevator) and LED8 is on at the interval of 0.5s; when communication at CAN2 is normal, group number is 8 (No.6 elevator) and LED8 flickers continuously (in group control dispatch).

Note: when communication at CAN1 is normal, LED3-8 off, please check:

1. Whether the group number is correct, L0=3~10

2. Whether the number of group control boards is more than 8

10.9.8 Diagram of communication interface
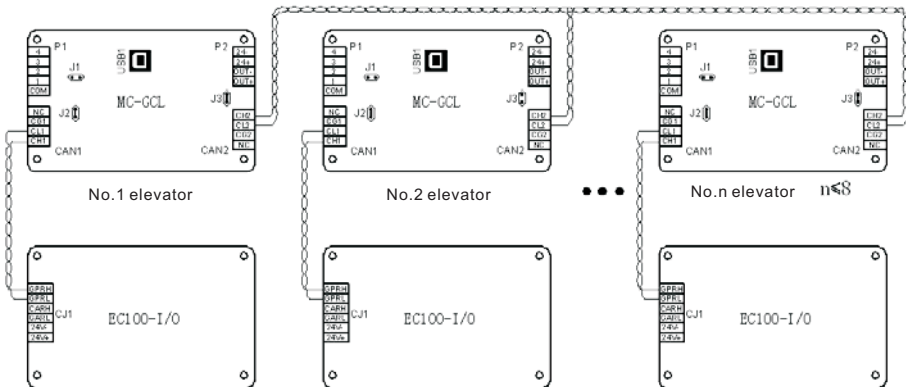
Figure 10-24 Diagram of GCL CAN communication interface

Precautions for wiring and debugging:
1. CL1 and CH1 of MC-GCL should be connected to GPRL and GPRH of EC100 in No.1 elevator, and so on;

2. All CL2 and CH2 of MC-GCL are in parallel connection;

3. The total number of MC-GCL is less than 8;

4. Short circuit all J2 of MC-GCL; short circuit J3 between No.1 and No. n elevator while disconnect J3 pins in other elevators;

5. No.1 elevator: MC-GCL is connected to EC100 (group number L0=3)

No. 2 elevator: MC-GCL is connected to EC100 (group number L0=4)

…

No. 8 elevator: MC-GCL is connected to EC100 (group number L0=10)

10.9.9 Debugging

10.9.9.1 Connection between MC-GCL and manual operator

USB cable
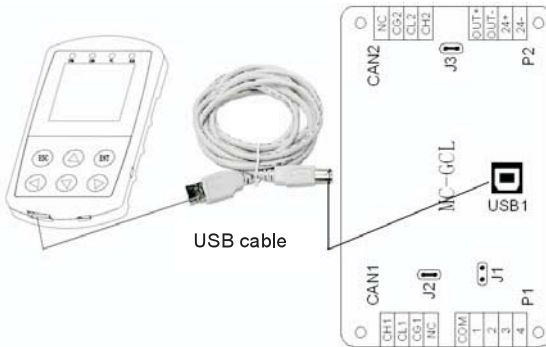
Figure 10-25 Connection of manual operator and MC-GCL

10.9.9.2 Initial debugging interface
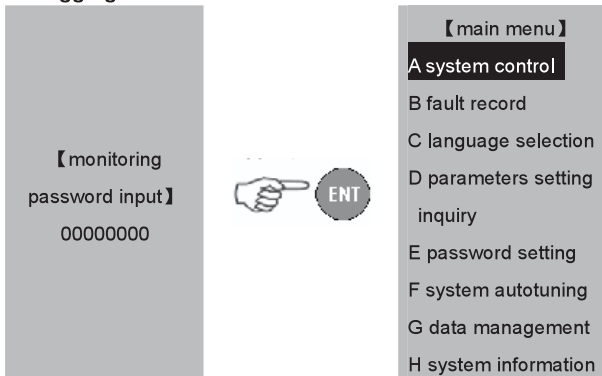
【monitoring

password input】

00000000

ENT

【main menu】

A system control

B fault record

C language selection

D parameters setting

 inquiry

E password setting

F system autotuning

G data management

H system information

The monitoring password can only enter into A, B and H in the main menu and they are only for read.

After inputting the monitoring password, pressing ESC can shift into the password debugging or factory password input mode.

【Monitoring

password input】

00000000

ESC

【Debugging

password input】

00000000

The original value of monitoring password and debugging password is 00000000.

If it is necessary to shift into the other modes after password entering, power off and enter again.

10.9.9.3 System monitoring --- calling and running state

【main menu】		【system control】		Auto opening
A system control		[1] calling and		Floor: 1 0mm/s
B fault record		running state		Balanced mode
C language		[2] random running		L: ABCDEFGH S: 1234
selection		[3] drive state		1234567890 1234567890
D parameters setting		[4] main controller		
inquiry		[5] car controller		
E password setting				1234567890 1234567890
F system autotuning				
G data management				
H system				
information				

1 — Auto   opening
2 — Floor: 1   0mm/s
3 — Balanced mode
4 — L: ABCDEFGH   S: 1234
5 — 1234567890 1234567890
6 —
7 — 1234567890 1234567890
8
9

Serial No.	Definition
1	Elevator state: automatic, inspection and group control
2	Current floor and running speed
3	Current mode
4	The highlight is the number involved in group control dispatch
5	Monitor recorded car command
6	Recorded up calling command (the arrow box means assigning the up

	command of the elevator)
7	Recorded down calling command (the arrow box means assigning the down command of the elevator)
8	Door state: opening, closing, open and closed
9	The highlight is the state of input point

10.9.9.4 Parameters setting inquiry

Move the cursor into D after entering into the main menu and press ENT into the parameters setting; the main menu is as below:

【main menu】　　　ENT　　　【parameters setting inquiry】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

10.9.9.5 Parameters setting inquiry--- system clock setting

【main menu】　　ENT　　【parameters setting inquiry】　　ENT　　【P0 system clock setting】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

00 year
01 month and day
02 hour and minute

Function code	Description	Setting range [default value]	Remark
P0_00	Year	2000～2099【2010】	
P0_01	Month and day	01.01～12.31【01.01】	

| P0_02 | Hour and minute | 00.00～23.59【12.00】 | |

10.9.9.6 Parameters setting inquiry--- floor of home landing

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
    H system information

ENT →

【parameters setting inquiry】
P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

ENT →

【P1 floor of home landing】
00 home landing at bottom
01 home landing in middle
02 home landing at top
03 group control home landing 4
04 group control home landing 5
05 group control home landing 6
06 group control home landing 7
07 group control home landing 8
08 VIP floor

Function code	Description	Setting range [default value]	Remark
P1_00	Home landing at bottom	00～64【01】	Default floor is at the bottom
Standby floor in rush hour up; separate standby—elevator A returns to standby floor (P2_03=0, the function is invalid)			
P1_01	Home landing in middle	00～64【00】	Default floor is in the middle
Separate standby—elevator B returns to standby floor (P2_03=0, the function is invalid)			
P1_02	Home landing at top	00～64【64】	Default floor is at the top
Standby floor in rush hour down; separate standby—elevator C returns to standby floor (P2_03=0, the function is invalid)			
P1_03	Group control home landing 4	00～64【00】	

Separate standby—elevator D returns to standby floor (P2_03=0, the function is invalid)			
P1_04	Group control home landing 5	00～64【00】	
Separate standby—elevator E returns to standby floor (P2_03=0, the function is invalid)			
P1_05	Group control home landing 6	00～64【00】	
Separate standby—elevator F returns to standby floor (P2_03=0, the function is invalid)			
P1_06	Group control home landing 7	00～64【00】	
Separate standby—elevator G returns to standby floor(P2_03=0, the function is invalid)			
P1_07	Group control home landing 8	00～64【00】	
Separate standby—elevator H returns to standby floor (P2_03=0, the function is invalid)			
P1_08	VIP floor	00～64【00】	

10.9.9.7 Parameters setting inquiry--- time setting

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
    H system information

【parameters setting inquiry】
P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

【P2 time setting】
00 idle time threshold
01 time threshold of external selection
02 time threshold of internal selection
03 time threshold of separate standby
04 T4
05 T5

Function code	Description	Setting range [default value]	Remark
P2_00	Idle time threshold	000.0～600.0【20】s	
Note: when the elevator cannot run and timeout, exit group control time.			
P2_01	Time threshold of external selection	00.0～10.0【2】s	

Note: time threshold for responding to external selection			
P2_02	Time threshold of internal selection	00.0～10.0【2】s	
Note: time threshold for responding to internal selection			
P2_03	Time threshold of separate standby	00000～60000【0】s	
Note: separate standby is valid at non-zero—when separate standby time is up without running direction, return to the set standby floor.			
P2_04	Customized	0000.0～6553.5【45】s	
Note: error duration that the elevator did not run with direction and timeout			
P2_05	Customized	0000.0～6553.5【45】s	
Note: error duration that the elevator had dispatch command without direction (2s)			

10.9.9.8 Parameters setting inquiry--- running mode setting

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
　H system information

ENT

【parameters setting inquiry】
P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

ENT

【P3 running mode setting】
00 timing rush hour mode enabling
01 start time of up rush hour
02 end time of up rush hour
03 start time of down rush hour
04 end time of down rush hour
05 auto rush hour mode enabling
06 threshold of auto rush hour
07 running time of auto rush hour
08 reserved
09 zoning mode 1 enabling

		10 zoning mode 1 start time
		11 zoning mode 1 end time
		12 mode 1 floor setting -16
		13 mode 1 floor setting -32
		14 mode 1 floor setting -48
		15 mode 1 floor setting -64
		16 zoning mode 2 enabling
		17 zoning mode 2 start time
		18 zoning mode 2 end time
		19 mode 2 floor setting -16
		20 mode 2 floor setting -32
		21 mode 2 floor setting -48
		22 mode 2 floor setting -64
		23 zoning mode 3 enabling
		24 zoning mode 3 start time
		25 zoning mode 3 end time
		26 mode 3 floor setting -16
		27 mode 3 floor setting -32
		28 mode 3 floor setting -48
		29 mode 3 floor setting -64
		30 MF input setting 1
		31 MF input setting 2
		32 MF input setting 3
		33 MF input setting 4
		34 F34
		35 F35

Function code	Description	Setting range [default value]	Remark
P3_00	Timing rush hour mode enabling	000～127【0】	
P3_01	Start time of up rush hour	00.00～23.59【00.00】	
P3_02	End time of up rush hour	00.00～23.59【00.00】	

P3_03	Start time of down rush hour	00.00~23.59【00.00】	
P3_04	End time of down rush hour	00.00~23.59【00.00】	
P3_05	Auto rush hour mode enabling	0~1【0】	
P3_06	Threshold of auto rush hour	0~9【2】	
P3_07	Running time of auto rush hour	00000~60000【3000】s	
P3_08	Reserved		
P3_09	Zoning mode 1 enabling	000~127【0】	
P3_10	Zoning mode 1 start time	00.00~23.59【00.00】	
P3_11	Zoning mode 1 end time	00.00~23.59【00.00】	
P3_12	Mode 1 floor setting -16	00000~65535【00000】	
P3_13	Mode 1 floor setting -32	00000~65535【00000】	
P3_14	Mode 1 floor setting -48	00000~65535【00000】	
P3_15	Mode 1 floor setting -64	00000~65535【00000】	
P3_16	Zoning mode 2 enabling	000~127【0】	
P3_17	Zoning mode 2 start time	00.00~23.59【00.00】	
P3_18	Zoning mode 2 end time	00.00~23.59【00.00】	
P3_19	Mode 2 floor setting -16	00000~65535【00000】	

P3_20	Mode 2 floor setting -32	00000~65535【00000】	
P3_21	Mode 2 floor setting -48	00000~65535【00000】	
P3_22	Mode 2 floor setting -64	00000~65535【00000】	
P3_23	Zoning mode 3 enabling	000~127【0】	
P3_24	Zoning mode 3 start time	00.00~23.59【00.00】	
P3_25	Zoning mode 3 end time	00.00~23.59【00.00】	
P3_26	Mode 3 floor setting -16	00000~65535【00000】	
P3_27	Mode 3 floor setting -32	00000~65535【00000】	
P3_28	Mode 3 floor setting -48	00000~65535【00000】	
P3_29	Mode 3 floor setting -64	00000~65535【00000】	
P3_30	MF input setting 1	0:None 3:Zoning mode 1 1:Up rush hour 4:Zoning mode 2 2:Down rush hour 5:Zoning mode 3	
P3_31	MF input setting 2	0:None 3:Zoning mode 1 1:Up rush hour 4:Zoning mode 2 2:Down rush hour 5:Zoning mode 3	
P3_32	MF input setting 3	0:None 3:Zoning mode 1 1:Up rush hour 4:Zoning mode 2 2:Down rush hour 5:Zoning mode 3	
P3_33	MF input setting 4	0:None 3:Zoning mode 1 1:Up rush hour 4:Zoning mode 2 2:Down rush hour 5:Zoning mode 3	
P3_34	Customized	00000~65535【00000】	

P3_35	Customized	00000～65535【1】	

10.9.9.9 Parameters setting inquiry--- data management

【main menu】	☞ ENT	【data management】
A system control		[1] data saving of the
B fault record		controller
C language selection		[2] restore to the factory
D parameters setting		value
inquiry		[3] fault history
E password setting		clearance
F system autotuning		[4] data of the controller
G data management		to PAD
H system information		[5] PAD data to the
		controller
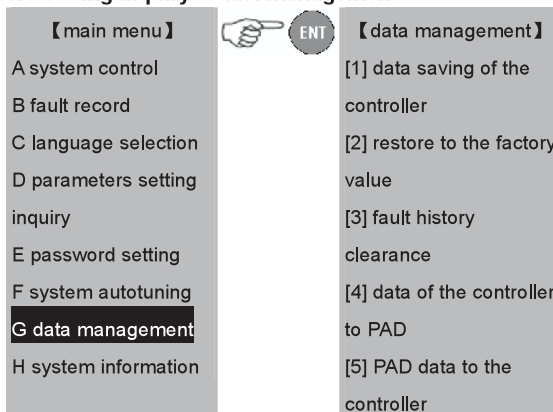
[1]Data storage of the controller: save the data after changing. If not, the data will restore to the original ones.

[2]Factory setting restore: restore the parameters of the controller to the factory setting.

[3]Fault history clearance: clear the fault history.

[4]Save the controller data to PAD.

[5] Download PAD data to the controller.

10.9.10 Precautions for separate standby of bias floors

		11F
10F	10F	10F
9F	9F	9F
8F	8F	8F
7F	7F	7F
6F	6F	6F
5F	5F	5F
4F	4F	4F
3F	3F	3F
2F	2F	2F
1F	1F	1F
-1F	-1F	Elevator C: no floor underground
-2F	Elevator B: 1 floor underground	

Elevator A: 2 floors underground
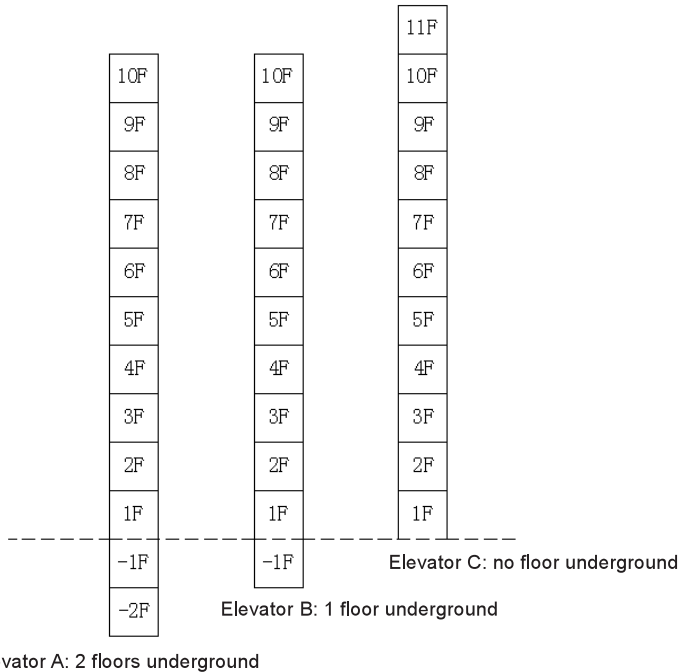
Figure 10-27 Bias floor distribution

Note: Elevator A 10 floors above ground and 2 floors underground; elevator B 10 floors above ground and 1 floor underground; elevator C 11 floors above ground and no floor underground

10.9.10.1 Precautions for EC100 parameters setting

Elevator A: L0-00 (group number) =03; L0-02 (down bias floor) =02; L0-01 (up bias floor) =00;

Elevator B: L0-00 (group number) =04; L0-02 (down bias floor) =01; L0-01 (up bias floor) =00;

Elevator C: L0-00 (group number) =05; L0-02 (down bias floor) =00; L0-01 (up bias floor) =00;

Note: L0-01=00 needs no setting for three elevators;

The group control system can calculate the up bias floor of elevator C according to down bias floors and total floors.

10.9.10.2 Precautions for MC-GCL parameters setting

In need of separate standby, elevator A stops at the 1st floor, elevator B at the 5th floor, and elevator C at the 10th floor. The parameters settings are as follows:

Elevator A:P1-00(down home landing)=03; P2-03(time threshold of separate standby)≠0 valid;

Elevator B:P1-00(down home landing)=06; P2-03(time threshold of separate standby)≠0 valid;

Elevator C:P1-00(down home landing)=10; P2-03(time threshold of separate standby)≠0 valid;

10.10 Instruction of EC-RDB

EC-RDB which adopts four safety relays with highly reliable design has passed the certification of the elevator safety circuit test.

10.10.1 Installation dimension
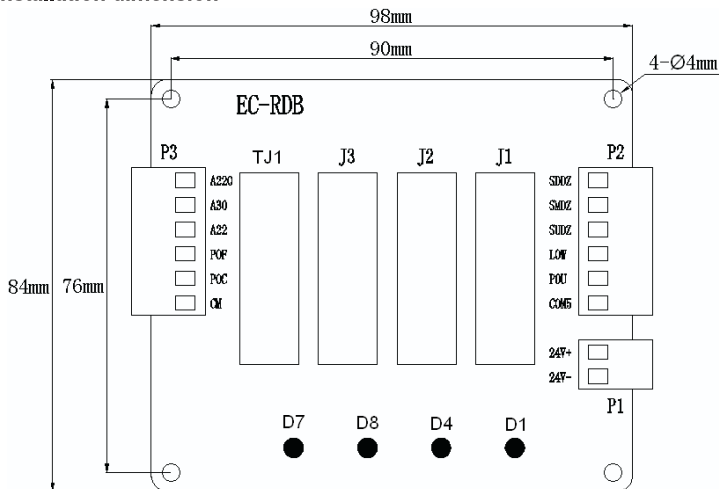
Figure 10-28 Installation dimension of EC-RDB

Installation method:

1. Install when all power supplies are disconnected.

2. Fix with screws according to the installation holes.

3. Connect the terminals and tighten up.

10.10.2 Configuration

Name	Function	Qty.	Position
EC-RDB	For opening the door in advance	One for each elevator	In control cabinet

10.10.3 Specification of the connectors

No	Model
P1	2EHDVC-5.08-2
P2, P3	2EHDVC-5.08-6

10.10.4 Electrical specification

10.10.4.1 Specification of the board

Name	EC-RDB
Color	Green
Thickness	1.6mm

Layers of layout	2

10.10.4.2 Specification of the board

Input voltage range	DC22V～DC26V

10.10.4.3 Working environment

Temperature	0 degree ~ 70 degree
Humidity	<95%
Soil fog	0.13ug/m3
Shock	Peak acceleration speed 100gn, 100 times
Vibration	10Hz-100Hz 50 times 100Hz-10Hz 50 times
Sudden pulse group interference	2.5KV

10.10.5 Definition of the input/output interface

10.10.5.1 Definition of P1

Serial No.	Pin	Terminal code	Terminal definition	Remark
P1	1	24V+	DC24V+ input terminal	
	2	24V-	DC0V input terminal	

10.10.5.2 Definition of P2 and P3

P2: detection input signal

P3: output signal of short circuit lock circuit

Serial No.	Pin	Terminal code	Terminal definition	Remark
P2	1	SDDZ	Up door area signal	
	2	SMDZ	Medium door area signal	
	3	SUDZ	Down door area signal	
	4	LOW	Low speed signal	
	5	POU	Pre-opening request output terminal	
	6	COM5		
P3	1	A220	Short circuit hall door and car lock circuit	
	2	A30		
	3	A22		
	4	POF	Provide relay adhesion detection point	

Serial No.	Pin	Terminal code	Terminal definition	Remark
	5	POC	Pre-opening/leveling response signal	
	6	CM	Common terminal of switch input signal	

10.10.6 Instruction of LED

Name	Instruction
D1	When J1 relay closes, D1 is on.
D4	When J2 relay closes, D4 is on.
D7	When TJ1 relay closes, D7 is on.
D8	When J3 relay closes, D8 is on.

10.10.7 Wiring diagram of EC-RDB and peripheral interface
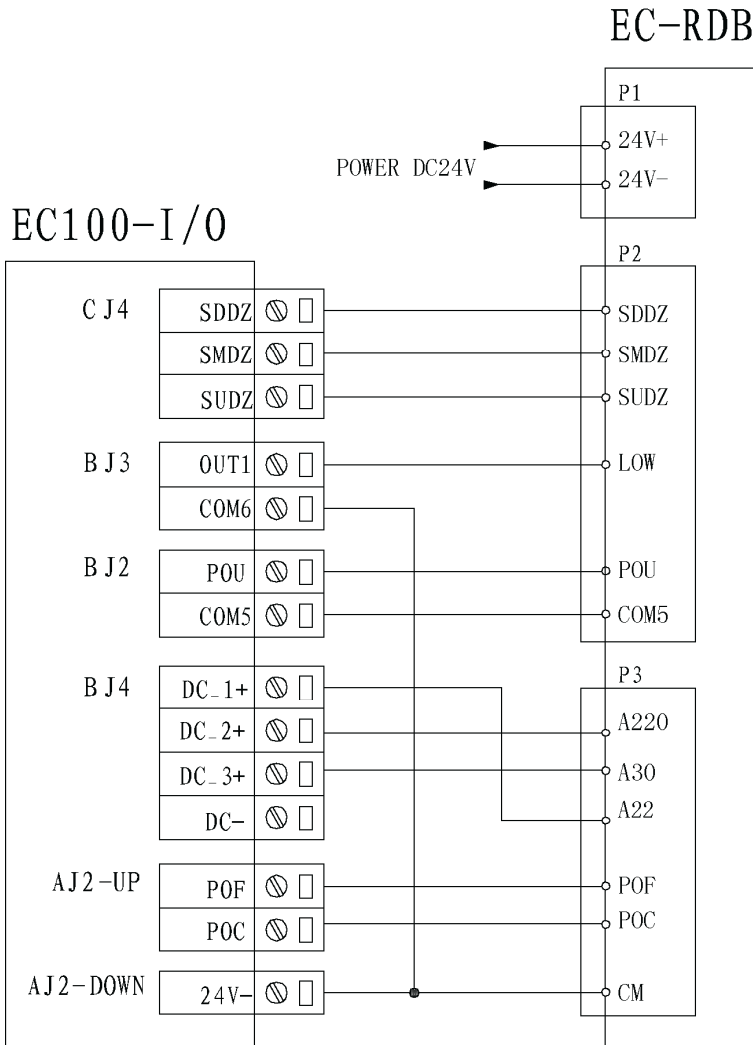
Figure 10-29 Wiring diagram of EC-RDB and peripheral interface

Chapter 11 Maintenance and hardware diagnosis

11.1 Maintenance intervals

If installed in an appropriate environment, the inverter requires very little maintenance. The table lists the routine maintenance intervals recommended by INVT.

Checking part		Checking item	Checking method	Criterion
Ambient environment		Check the ambient temperature, humidity and vibration and ensure there is no dust, gas, oil fog and water drop.	Visual examination and instrument test	Conforming to the manual
		Ensure there are no tools or other foreign or dangerous objects	Visual examination	There are no tools or dangerous objects.
Voltage		Ensure the main circuit and control circuit are normal.	Measurement by millimeter	Conforming to the manual
Keypad		Ensure the display is clear enough	Visual examination	The characters are displayed normally.
		Ensure the characters are displayed totally	Visual examination	Conforming to the manual
Main circuit	For public use	Ensure the screws are tightened	Tighten up	NA
		Ensure there is no distortion, crackles, damage or color-changing caused by overheating and aging to the machine and insulator.	Visual examination	NA

Checking part	Checking item	Checking method	Criterion
	Ensure there is no dust and dirtiness	Visual examination	NA **Note:** if the color of the copper blocks change, it does not mean that there is something wrong with the features.
The lead of the conductors	Ensure that there is no distortion or color-changing of the conductors caused by overheating.	Visual examination	NA
	Ensure that there are no crackles or color-changing of the protective layers.	Visual examination	NA
Terminals seat	Ensure that there is no damage	Visual examination	NA
Filter capacitors	Ensure that there is no weeping, color-changing, crackles and cassis expansion.	Visual examination	NA
	Ensure the safety valve is in the right place.	Estimate the usage time according to the maintenance or measure the static capacity.	NA
	If necessary, measure	Measure the	The static

Checking part	Checking item	Checking method	Criterion
	the static capacity.	capacity by instruments.	capacity is above or equal to the original value *0.85.
Resistors	Ensure whether there is replacement and splitting caused by overheating.	Smelling and visual examination	NA
	Ensure that there is no offline.	Visual examination or remove one ending to calculate or measure with multimeters	The resistors are in ±10% of the standard value.
Transformers and reactors	Ensure there is no abnormal vibration, noise and smelling,	Hearing, smelling and visual examination	NA
Electromagnetism contactors and relays	Ensure whether there is vibration noise in the workrooms.	Hearing	NA
	Ensure the contactor is good enough.	Visual examination	NA
Control circuit	PCB and plugs	Ensure there is no loose screws and contactors.	Fasten up	NA
	Ensure there is no smelling and color-changing.	Smelling and visual examination	NA
	Ensure there are no crackles, damage distortion and rust.	Visual examination	NA

Checking part		Checking item	Checking method	Criterion
Cooling system		Ensure there is no weeping and distortion to the capacitors.	Visual examination or estimate the usage time according to the maintenance information	NA
	Cooling fan	Estimate whether there is abnormal noise and vibration.	Hearing and Visual examination or rotate with hand	Stable rotation
		Estimate there is no losses screw.	Tighten up	NA
		Ensure there is no color-changing caused by overheating.	Visual examination or estimate the usage time according to the maintenance information	NA
	Ventilating duct	Ensure whether there is stuff or foreign objection in the cooling fan, air vent.	Visual examination	NA

11.2 Cooling fan

The inverter's cooling fan has a minimum life span of 25,000 operating hours. The actual life span depends on the inverter usage and ambient temperature.

The operating hours can be found through parameters.

Fan failure can be predicted by the increasing noise from the fan bearings. If the inverter is operated in a critical part of a process, fan replacement is recommended once these symptoms appear. Replacement fans are available from INVT.

11.2.1 Replacing the cooling fan

⚠️	◆ Read and follow the instructions in chapter **Safety Precautions**. Ignoring the instructions would cause physical injury or death, or damage to the equipment.

1. Stop the inverter and disconnect it from the AC power source and wait for at least the time designated on the inverter.

2. Lever the fan holder off the drive frame with a screwdriver and lift the hinged fan holder slightly upward from its front edge.

3. Free the fan cable from the clip.

4. Disconnect the fan cable.

5. Remove the fan holder from the hinges.

6. Install the new fan holder including the fan in reverse order.

7. Restore power.

11.3 Capacitors

11.3.1 Reforming the capacitors

The DC bus capacitors must be reformed according to the operation instruction if the inverter has been stored for a long time. The storing time is counted form the producing date other than the delivery data which has been marked in the serial number of the inverter.

Time	Operational principle
Storing time less than 1 year	Operation without charging
Storing time 1-2 years	Connect with the power for 1 hour before first ON command
Storing time 2-3 years	Use power surge to charge for the inverter • Add 25% rated voltage for 30 minutes • Add 50% rated voltage for 30 minutes • Add 75% rated voltage for 30 minutes • Add 100% rated voltage for 30 minutes
Storing time more than 3 years	Use power surge to charge for the inverter • Add 25% rated voltage for 2 hours • Add 50% rated voltage for 2 hours • Add 75% rated voltage for 2 hours

	• Add 100% rated voltage for 2 hours

The method of using power surge to charge for the inverter:

The right selection of Power surge depends on the supply power of the inverter. Single phase 230V AC/2A power surge applied to the inverter with single/three-phase 230V AC as its input voltage. The inverter with single/three-phase 230V AC as its input voltage can apply Single phase 230V AC/2A power surge. All DC bus capacitors charge at the same time because there is one rectifier.

High-voltage inverter needs enough voltage (for example, 400V) during charging. The small capacitor power (2A is enough) can be used because the capacitor nearly does not need current when charging.

The operation method of inverter charging through resistors (LEDs):

The charging time is at least 60 minutes if charge the DC bus capacitor directly through supply power. This operation is available on normal temperature and no-load condition and the resistor should be serially connected in the 3-phase circuits of the power supply:

400V driven device: 1k/100W resistor. LED of 100W can be used when the power voltage is no more than 400V. But if used, the light may be off or weak during charging.
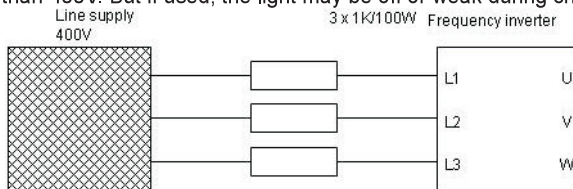
Figure 11-1 400V charging illustration of the driven device

11.3.2 Change electrolytic capacitors

	◆ Read and follow the instructions in chapter *Safety Precautions*. Ignoring the instructions may cause physical injury or death, or damage to the equipment.

Change electrolytic capacitors if the working hours of electrolytic capacitors in the inverter are above 35000. Please contact with the local INVT offices or dial our national service hotline (400-700-9997) for detailed operation.

11.4 Power cable

	◆ Read and follow the instructions in chapter *Safety Precautions*. Ignoring the instructions may cause physical injury or death, or damage to the equipment.

1. Stop the drive and disconnect it from the power line. Wait for at least the time designated on the inverter.

2. Check the tightness of the power cable connections.

3. Restore power.

Chapter 12　Fault code

No.	Fault code of controller	Fault code of LED	Fault instruction	Fault reason	Solution	Method
1	1	1	Main control board fault	Internal fault	Replace the main control board	Stop immediately
2	2	2	Power fault of IO board	1.Power damage (external DC 24V)or offline 2.Cable disconnection	1.Check the cable connection between IO board and master 2.Check the power supply (24V)	Stop immediately; fault reset automatically
3	5	5	No pulse feedback	1.DSP communication fault 2.Corresponding speed is 0	1.Replace the main control board; 2.Modify the parameter	Stop immediately; fault reset automatically
4	6	6	Pulse reversion	1.Pulse direction parameters fault 2.Running direction of the elevator reverses 3.Elevator sliding down	1.Modify the parameter and counting direction 2.Set load compensation 3.Reautotuning of the master	Stop immediately; fault reset automatically
5	9	9	Thermal protection	Thermal protection	1.Check logic and connection of input point 2.Improve motor cooling	Preferred stopping, fault reset delay
6	11	11	Car communica-tion fault	No communication between the controller and the car	1.Check the communication cable circuit and plug-ins. 2.Check the power	Preferred stopping, fault reset automatically

8	30	𝟥𝟢	Safety circuit breaking	1.Safety circuit disconnection 2.Damage to the contact of the relay 3.Abnormal high-voltage detection	1.Check the safety circuit 2.Replace the contactor of the safety circuit or change the IO board 3.Check the high-voltage circuit	Stop immediately; fault reset automatically
				supply (DC24V). 3.Check the communication protocol 4.Set IC card baud rate incorrectly		
9	31	𝟥𝟣	Lock open in running	1.Misadjustment of the position of the door knife 2.Bad connection of the contact of the door lock 3.Bad connection of the car lock or hall lock	1.Adjust the door lock 2.Replace the contactor of the door lock 3.Check the circuit of the door lock	Stop immediately; fault reset automatically
10	32	𝟥𝟤	Short circuit fault of door lock	1.The lock signal and opening signal act at the same time 2.After the opening signal output for 5s, the lock still	1.Check the short circuit of the door lock 2.Check the misaction of the switch 3.Check the door operator	Stop; fault reset automatically

				disconnect		
11	33	33	Do not stop at the door area	Elevator protection caused by other faults	Analyze with other faults	Fault tips
12	34	34	DEC overtime	The deceleration time exceeds the time calculated in the parameter	1.Sliding of the elevator rope 2.Wrong parameters setting	Stop immediately; reset automatically
13	35	35	Single floor running overtime fault	1.Signal loss in the door area 2.Motor stall or car blocked 3.Too high floor	1.Check the signal in door area 2.Check the tractor 3. Wrong parameters setting	Stop immediately; fault reset manually
14	37	37	Whole running overtime fault	1.Signal loss in the door area 2.Motor stall or car blocked 3.For deceleration	1.Check the signal in door area 2.Check the tractor 3. Wrong parameters setting	Stop immediately; fault reset manually
15	40	40	Abnormal signal in door area	Keep in the door area after start quickly for 5s	1.Check the braking device is open 2.Check the switch in door area	Stop immediately; fault reset manually
16	42	42	DEC forced switch of the bottom and top floor act at the same time	Deceleration forced switch of the bottom and top floor act at the same time	1.Check the forced switch is damaged or offline 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
17	43	43	Earthquake action	The main board detects the	1.Check the corresponding	Function tips

				earthquake	logic setting 2.Corresponding detection point damage	
18	46	![46]	Abnormal elevator speed	The running speed of the elevator exceeds 115% of the rated speed	1.Check the speed feedback of the encoder 2.Check the parameters setting	Stop immediately; fault reset automatically
19	47	![47]	Lower limit switch action	Lower limit switch action	1.Check the installation position of the lower limit switch 2.Check the corresponding logic setting 3.Check the switch wiring	Stop immediately; fault reset automatically
20	48	![48]	Upper limit switch action	Upper limit switch action	1.Check the installation position of the upper limit switch 2.Check the corresponding logic setting 3.Check the switch wiring	Stop immediately; fault reset automatically
21	50	![50]	Overtime of the running contactor closing	No feedback after the running contactor closing	1.Replace the contactor 2.Check the external wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically

22	51	5I	Overtime of the running contactor opening	Feedback after the running contactor releasing	1.Replace the contactor 2.Check the external wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
23	52	52	Overtime of the braking contactor closing	No feedback after the braking contactor closing	1.Replace the contactor 2.Check the external wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
24	53	53	Overtime of the braking contactor opening	Feedback after the braking contactor releasing	1.Replace the contactor 2.Check the external wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
25	54	54	Brake travel action overtime	1.The brake does not open totally when the elevator starts 2.The brake travel switch is not installed properly 3.The brake opens slowly 4.The MF input is set to dual brake by accident	1.Adjust the position of 2.Adjust braking gap 3.The brake travel switch does not contact well 4.Check the corresponding logic setting 5. Check the definition of MF input	Stop immediately; fault reset automatically

26	55	55	Brake travel reset overtime	1.The brake does not close totally when the elevator stops 2.The brake travel switch is not installed properly 3.The brake opens slowly 4.The MF input is set to dual brake by accident	1.Adjust the position of 2.Adjust braking gap 3.The brake travel switch does not contact well 4.Check the corresponding logic setting	Stop immediately; fault reset automatically
27	56	56	UPS output relay closing overtime	No feedback after UPS switching	1.Check peripheral wiring 2.Check UPS output relay	Prohibit UPS back leveling; fault reset and exit UPS automatically
28	57	57	Star-delta contactor closing overtime	1.No feedback after the elevator starts 2.Set MF input to star-delta independent output by accident	1.Check peripheral wiring 2.Check the corresponding logic setting 3.Check the definition of MF input	Prohibit the elevator starting; fault reset automatically
29	58	58	Hardware enabling adhesion	No detection of the signal after the elevator starts	1.Check the connection cables of the IO board 2.Check the contactor and connection	Stop immediately; fault reset automatically
30	59	59	Star-delta contactor opening	1.Detection of the signal after the elevator	1.Check peripheral wiring 2.Check the	Prohibit the elevator starting; fault

			overtime	stops 2.Set MF input to star-delta independent output by accident	corresponding logic setting 3.Check the definition of MF input	reset automatically
31	60	60	Opening fault	No detection of the signal after opening for 20s	1.Clean the door sill 2.Enlarge the low speed torque of the door 3.Check the corresponding logic setting	Fault tips
32	61	61	Closing fault	No detection of the signal after closing for 10s	1.Clean the door sill 2.Enlarge the low speed torque of the door 3.Check the corresponding logic setting	Fault tips
33	62	62	Door closed/door open act at the same time	Limit switch of door closed/open act at the same time	1.Limit switch damage 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
34	64	64	Safety touch pad /beam action overtime	Safety touch pad/ continuous action of beam overtime	1.Human obstruction 2.Detection point damage, disconnection or short circuit 3.Check the corresponding	Fault tips

					logic setting	
35	65	𝟨𝟻	Auto aid	The detection of auto aid signal by the main board	1.Check the corresponding logic setting 2.Corresponding detection point damage	Function tips
36	66	𝟨𝟨	Door lock block when door closed	Door lock block when door closed	1.Adjust the digital position of the door 2.Exchange lock device 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
37	70	𝟩𝟢	UP/DOWN fast limit switch act at the same time	UP/DOWN fast limit switch act at the same time	1.Switch damage or disconnection 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
38	71	𝟩𝟣	UP/DOWN speed forced DEC switches act at the same time	The forced deceleration switches act at the same time	1.Switch damage or disconnection 2.Check the corresponding logic setting	Emergency deceleration to stop; fault reset automatically
39	72	𝟩𝟤	DOWN low speed forced DEC switch adhesion	DOWN speed forced deceleration switch and the terminal switch do not reset when the elevator leaves the ground floor	1.Switch damage or disconnection 2.Check the speed or deceleration/acceleration curve setting	Preferred leveling; fault reset automatically

				for 9s		
40	73	73	UP speed forced DEC switch adhesion	UP speed forced deceleration switch and the terminal switch do not reset when the elevator leaves the ground floor for 9s	1.Switch damage or disconnection 2.Check the speed or deceleration/acceleration curve setting	Preferred leveling; fault reset automatically
41	74	74	MEDIUM/ DOWN speed forced DEC switch adhesion	MEDIUM/DOWN speed forced deceleration switch does not reset when the elevator leaves ground floor for 9s	Switch damage or disconnection	Preferred leveling; fault reset automatically
42	75	75	UP/MEDIUM speed forced DEC switch adhesion	UP/MEDIUM speed forced deceleration switch does not reset when the elevator leaves ground floor for 9s	Switch damage or disconnection	Preferred leveling; fault reset automatically
43	76	76	Forced DEC switch faulty action	Up forced deceleration switch faulty action when the elevator goes up; down forced deceleration switch faulty action when the	Switch damage or disconnection	Emergency deceleration to leveling; fault reset automatically

44	77	77	Terminal overspeed running	When the elevator runs to the terminal and the forced deceleration switch acts, the speed exceeds the corresponding speed of the switch	Switch damage or disconnection	Stop immediately; fault reset manually
				elevator goes down		
45	79	79	Abnormal elevator position	1.The elevator is in the terminal station, but the corresponding low speed forced deceleration switch does not act 2.The corresponding low speed forced deceleration switch acts, but the elevator is in the terminal station 3.Information loss of the hoistway 4.Floor error	1.Disconnection or short circuit of the low speed forced deceleration switch 2.High speed counting pulse and door area signal loss 3.Check the wire rope 4.Check the corresponding logic setting 5.The position of the forced deceleration switch changed after hoistway autotuning	Preferred leveling, fault reset automatically

46	82	**82**	Contactor adhesion fault exceeds the setting	No. 50，51, 52, 53, 54, 55, 57, 59 fault more than 5 times	Replace the corresponding contactor	Stop immediately; fault reset after power off
47	83	**83**	Fault of drive unit exceeds the setting value	Drive unit fault exceeds the value of P5.07		Stop immediately; fault reset after power off
48	84	**84**	Main board error		Contact with the manufacturer	Unable to run
49	89	**89**	Maintenance switch action in running	Manual maintenance action or bad connection of the maintenance switch	Check the switch and circuit	Stop immediately
50	101	**A1**	Inverter unit U phase protection	1.The output of the main circuit is grounded or short circuited 2.Too long connection wires of the tractor 3.Internal damage to IGBT 4.Internal connection of the controller is loose	1.Check the external problems such as the connection 2.Install the reactor or output filter 3.Contact with the manufacturer 4.Check the internal problems such as connection	Stop immediately; fault restore, fault reset when power off
51	102	**A2**	Inverter unit V phase protection			
52	103	**A3**	Inverter unit W phase protection			
53	104	**A4**	ACC overcurrent	1.The output of the main circuit is grounded or short circuited	1.Check the parameters of the master 2.Check the	Stop immediately; fault reset automatically

54	105	**AS**	DEC overcurrent	2.Wrong parameters setting of the name plate of the master 3.Too large load 4.Wrong encoder signal 5.Acceleration curve is too swift	encoder feedback 3.Adjust S curve 4.Reautotuning of the motor 5.Check the brake is open totally 6.Check the synchronous master adhesion 7.Check the mechanical stuck 8.Check the balance coefficient	
55	106	**A6**	Constant speed overcurrent			
56	107	**A7**	ACC over voltage	1.Too high input voltage 2.Serious counter EMF of the tractor 3.Large braking resistor or abnormal braking unit 4.Acceleration curve is too swift	1.Check the bus voltage 2.Check the balance coefficient 3.Select suitable braking resistor 4.Check the connection of the braking resistor 5.Adjust S curve	Stop immediately; fault reset automatically
57	108	**A8**	DEC over voltage			
58	109	**A9**	Constant speed over voltage			
59	110	**b0**	Under-voltage fault	1.Sudden power off 2.Too low input voltage 3.Abnormal drive control board	1.Check the external power supply and whether the power is off when the motor is running 2.Check the contacting layer of the input power supply	Stop immediately; fault reset automatically

					3.Contact with the manufacturer	
60	111	bI	Motor overload	1.Wrong parameters setting 2.Abnormal braking circuit 3.Too heavy load	1.Adjust the parameters 2.Check the braking circuit	Stop immediately; fault reset automatically
61	112	b2	System overload	1. Abnormal braking circuit 2.Too large load 3.Check the encoder feedback signal 4.Check the parameters of the master 5.Check the power cable of the master	1.Check the braking circuit and braking devices 2.Reduce the load 3.Check the feedback signal of the encoder and the original angle of the encoder 4.Check the parameter setting of the name plate of the master 5.Check the power cable of the master	Stop immediately; fault reset automatically
62	113	b3	Phase loss in input side	1.Asymmetrical input power 2.Abnormal drive control board	1.Set through the parameters 2.Check the 3 phase power supply in input side and the power voltage 3.Contact with the manufacturer	Stop immediately; fault reset automatically
63	114	b4	Phase loss in output	1.Loose connection of the	1.Check the contactor in input	Stop immediately;

			side	output of the main circuit 2.Damage to the master	side 2.Solve the master fault	fault reset automatically
64	115	b5	Overheat of the rectifier module	1.Sudden overcurrent 2.Output grounding short circuit 3.Air duct block or damage 4.Environment temperature is too high 5.Control board or plug-in loose 6.Abnormal main board or damage to the sensor	1.Refer to the overcurrent measurement 2.Reconfigure 3.Dredge the air duct or change the fan 4.Reduce the temperature 5.Contact with the manufacturer	Stop immediately; fault reset automatically
65	116	b6	Overheat of the inverter module			
66	118	b8	485 communica-tion fault		Check the parameters setting	Fault tips
67	119	b9	Current detection fault	1.Bad connection of the control board 2.Auxiliary power damage 3.Hall device damage 4.Amplifying circuit abnormal 5.No enabling of the drive module	1.Check the cable of the main board and the drive board 2.Replace the main board or main control board 3.Check the main board	Stop immediately; fault reset automatically
68	120	C0	Autotuning fault of the	1.Wrong setting of the autotuning	1.Adjust the autotuning static	Stop immediately;

			motor	static current of the master 2.Wrong parameters setting 3.The capacity does not match that of the drive board 4.The running contactor does not close	identification current 2.Set the rated parameters according to the name plate of the motor 3.Check the motor connection 4.Change the drive board	fault reset automatically
69	121	⌐┃	Encoder offline	1.Encoder damage or offline 2.Too short time for offline detection	1.Check the encoder and the connection 2.Check the braking 3.Check the speed setting	Stop immediately; fault reset automatically
70	122	⌐2	Encoder reversion	1.Signal wires reverse 2.Too short time for reverse detection	1.Serious sliding 2.Change the direction of the encoder and reautotuning of the master	Stop immediately; fault reset automatically
71	125	⌐5	Fault of magnetic pole position detection	Abnormal magnetic pole position detection of the synchronous master	Change the direction of the encoder and reautotuning of the master	Unable to run
72	126	⌐6	Braking circuit fault	1.Damage to the braking circuit or braking pipes 2.Low external	1.Check the braking unit 2.Replace new braking pipe	Stop immediately; fault reset automatically

				braking resistance	3.Increase the braking resistance	
73	131	dI	CPU abnormal	CPU communication overtime	1.Restart after the power off in the system 2.Replace the main controller	Stop immediately; fault reset automatically
74	132	d2	Excessive speed deviation	1. Excessive rotating speed deviation 2.Running fast 3.Over adjustment of the system	1.Check the encoder and the connection 2.Add the gain 3.Reautotuning of the master	Stop immediately; fault reset automatically
75	137	d7	With running signal, but without hardware enabling signal	1.Disconnection of the hardware enabling wires 2.Damage to the contact of the running contactor	1.Check the circuit and the connection 2.Check the contact of the contactor	Stop immediately; fault reset automatically
76	138	d8	Motor short circuit to the ground software fault	1.Damage to the motor wires, contact with the shell 2. Motor insulation damage, contact with the shell	1.Check the motor connection 2.Check the motor insulation	Stop immediately; fault restore, fault reset when power off
77	139	d9	Motor short circuit to the ground hardware fault	1.Damage to the motor wires, contact with the shell 2. Motor insulation	1.Check the motor connection 2.Check the motor insulation	Stop immediately; fault restore, fault reset when power off

|				damage, contact with the shell		

Chapter 13 Appendix

13.1 10-2-16 Binary table

Decimal	binary	hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

13.2 Definition table

Displayed						
Meaning	0	1	2	3	4	5
Displayed						
Meaning	6	7	8	9	A	B
Displayed						
Meaning	C	D	E	F	H	L

13.3 Meaning of special characters

| Serial No.	Picture	Meaning
1		Displaying in the inspection car "=" means the elevator is in the leveling position of 12th floor
2		Displaying outside the car means the inspection state
3		Displaying outside the car "F" means the elevator is full running
4		Monitor inside the car "OL" means overload
5		Up arrow means the elevator is going to go up. Rolling arrow means the elevator is going up. The quicker the rolling speed is, the faster the elevator is running.
6		Down arrow means the elevator is going to go down. Rolling arrow means the elevator is going down. The quicker the rolling speed is, the faster the elevator is running.
7		The monitor is in the state of floor setting.
8		The monitor is in the state of multiple-function displaying.
9		"V" means the version of the elevator. 12 means version 1.2. Display when power on.
10		The elevator is locked.

13.4 Communication terminal resistance and communication indicator

13.4.1 Terminal resistance of DC-03A monitor

J3 on DC-03A is the across terminal of the terminal resistance.

The displaying board on the bottom floor and in the control box need to short-circuit.

J3 across terminal of the communication terminal resistance
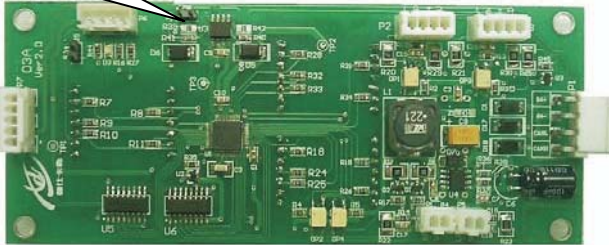
The communication resistor is usually 600ohm when all connection is normal. If the it is 120ohm, there is a communication terminal resistance lost.

13.4.2 Communication indicator and instruction of the operational panel

Code	Indicator name	Indicator instruction
Cc	Car communication indicator	Flashing when communication is connected Off when no communication
Lc	Elevator local indicator	On when elevator is locked.

13.4.3 DC-01 communication indicator

Code	Indicator name	Indicator instruction
LED9	Running communication indicator	Flashing when normal communication. On and off when abnormal communication

13.4.4 DC-03A communication indicator

Code	Indicator name	Indicator instruction
D3	Running communication indicator	Off when normal communication Flashing when no communication