Operation Manual

EC100 Elevator Intelligent Integrated Machine

INVT Elevator Control Technology (Wuxi) Co.,Ltd.

Preface

EC100 elevator intelligent integrated machine is the new generation intelligent elevator control system integrated with drive, control and network communication technologies. 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 safety and reliability, operation, economy and individualized design.

Main features:

- Integrated design, simple wiring and easy debugging
- The highest floor: 64th floor; max. speed: 6m/s
- Distance control principle, automatic generation of N curves (without step speed)
- Automatic identification running of low floor station
- Advanced starting compensation in the absence of weighing sensor
- Synchronous and asynchronous master; Static and dynamic self-tuning function
- Vector control
- Carries encoder interface for synchronous and asynchronous master to realize high precision speed control and position control
- All CAN serial communication to improve data transmission capability and enhance communication reliability
- Automatic car position correction, forced DEC switch monitoring function, anti-top hitting and bottom-clashing function
- Single-phase AC220V low voltage aid function
- LED displaying and operation keys, compatible with manual operator and PC debugging software
- Static component certification, multiple safety protection; meet the standards of EN81 and GB7588
- EMC meet C3 standards
- Redundancy safety design. Both elevator control and drive control are equipped with safety protection function to greatly enhance safety coefficient.
- Intelligent, network-based control group control on up to 8 elevators

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	Quantity	Installation position	Remarks
1	EC100 elevator intelligent integrated machine	based on actual condition	Motor drive control and elevator logic control	1 for each elevator	Elevator control cabinet	Compulsory, select models according to motor power and rated current
2	Manual operator	EC100-PAD	Used for elevator controller debugging		EC100 elevator intelligent integrated machine	Optional
3	EC100-I/O interface board	EC100-I/O	Used for input/output interface shifting of control cabinet	1 for each elevator	Elevator control cabinet	Compulsory, one connection cable with DB62 core
4	Car top board	EC-CTB	Used for car signal sampling and door control	1 for each elevator, support up to 64 floors	Car top	Compulsory
5	Car instruction extension board	EC-CCB	Input switch and top board calling extension of the car	Extend 16 floors for the first one, after that, extend 20 floors with each additional one	Control cabinet	Compulsory
6	Display panel in the car	Matrix Screen: DC-03x LCD: DC-07x	Used for displaying in the car	1 for each elevator	Control cabinet	Standard
7	Lobby calling display		Used for lobby calling and floor display	1 for each lobby calling display	Calling box	

No.	Product name	Product model	Application	Quantity	Installation position	Remarks
	panel					
8	Image device	LM21	Used in the car with voice announcing function	1 for each elevator	Control cabinet	Optional
9	Ethernet module	PA_DP/E	Used for ethernet monitoring	1 for each elevator	EC100 integrated machine	Optional
10	Group control board	MC-GCL	For group control communication	1 for each elevator	Control cabinet of the elevator	Optional
11	Advance door open board	EC-RDB	Used for advance door opening, creeping leveling and UCMP detection	1 for each elevator	Elevator control cabinet	Optional, it is required to install three door area signals for synchronous motor
12	EC-UCM controller	EC-UCM	Used for advance door opening, creeping leveling and UCMP detection	1 for each elevator	Elevator control cabinet	Optional, it is required to install three door area signals, support syn/asynchronous motor

1.2 Software standard function table

No	Type	Function name	Function instruction	Remark
1	System	Direct stop operation	Based on distance control principle, generating running curve in real time	Standard
2		PLC programmable definition	Users can, by combining with main board parameters, conduct logic control on OUT1/2 relay of I/O board and input points of car/car top board.	Standard
3		Built-in pre-weighing compensation	External weighing compensation device is not needed when synchronous motor adopts speed loop and position loop for adjustment	Standard

No	Type	Function name	Function instruction	Remark
4		Master autotuning	Static and dynamic autotuning	Standard
5		Hoistway height autotuning	Hoistway information autotuning is required before first running, which includes the height of each floor and the forced DEC switch position.	Standard
6		Full selective	In automatic or attendant state, the elevator will, during running, respond to command signal in the car while responding automatically to up/down calling button signal. Passengers on each floor can call the elevator by registering up/down calling signal	Standard
7		Parallel operation	The system carries parallel interface, which is to be connected with corresponding CAN communication cable to realize parallel connection.	Function selection
8		Real-time clock management	The system carries real-time clock chip, which can work for 3 years without power source.	Standard
9		Manual operator	The LCD manual operator carries Chinese/English menu and supports such functions as parameters setting, fault inquiry, state monitoring and parameter upload/download (simplified operator does not support parameter upload/download)	Optional
10		Self-detection on brake force	Carries manual and automatic self-detection modes for brake force, intelligent torque detection	Function selection
11	Protection	Overcurrent protection	Protect and stop once motor overcurrent is detected	Standard
12		Over voltage protection	Protect and stop once motor overvoltage is detected	Standard
13		Overload protection	Protect and stop once motor or drive overload is detected	Standard
14		Superload protection	The elevator will keep the door opening if it is in overload state in non-inspection state, and the buzzer will alarm. Note: Overload switch acts before the door lock is closed and the elevator opens the door reversely; overload protection is cancelled automatically after door lock is closed	Standard
15		Overspeed	Ensure the running speed is in the safe range during	Standard

No	Type	Function name	Function instruction	Remark
		Protection	operation	
16		Bus voltage fault protection	Protect and stop once bus undervoltage or overvoltage is detected	Standard
17		Phase loss protection	Protect and stop when input/output phase loss is detected	Standard
18		To-ground short-circuit detection	Inspect U, V and W during powering on to determine whether short-circuit exists	Standard
19		Inverter module overheat protection	Protect and stop when inverter module overheat is detected.	Standard
20		Rectifier overheat protection	Protect and stop when rectifier overheat is detected.	Standard
21		Motor overheat protection	If the thermal protection input signal acts, the elevator will stop and open at the nearest leveling position, and it will resume normal operation after passing parameter thermal protection delay time upon reset of thermal protection input signal point.	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 switch is detected to be adhesive.	Standard
24		Door beam protection	During closing, if the door is blocked, the beam point acts and opens the door. Note: Beam protection RSE will be automatically canceled in fire operation and the safety edge SE is valid (RSE acts as the front door beam in single door operator application).	Standard
25		Split-level protection	The elevator returns to the ground floor for correction when split-level occurred	Standard
26		Encoder feedback detection protection	The system determines the current height and speed of the car through high-speed counter. In running state, the system will stop the elevator if there is no encoder feedback.	Standard

No	Type	Function name	Function instruction	Remark
27		Reverse running protection	The system identifies the direction through high speed counting. The system will stop if the running direction is different from the command direction.	Standard
28		Running time protection during entire process	In non-inspection state, 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 brake travel switch	Detect the switch and protect automatically if abnormal (36 dual brake detection defined by F0_12; 39 start three brake detection function defined by F0_14)	Standard
30		Contact detection of running contactor	The system detects in elevator running or stop state if the pull-in and release of running output contactor is normal, if abnormal, system will protect automatically.	Standard
31		Contact detection of braking contactor	The system detect in brake contactor running or stop state if the pull-in and release of brake contactor is normal, if abnormal, the system will protect automatically.	Standard
32		Contact detection of door lock contactor	The elevator detects before or during running if the door lock circuit is disconnected, if yes, the system will protect automatically.	Optional
33		Contact detection of safety contactor	The system detects if safety circuit is disconnected in cases where there is working power, if disconnected, the system will protect automatically.	Optional
34		Door lock off protection	The system will protect automatically when door lock is detected to be off, and output close signal. The drive locks IGBT immediately, which often follows with 137 fault.	Standard
35		Door lock short circuit protection	The system detects in automatic running mode if door lock is disconnected each time the door opens. After applying EC-RDB or EC-UCM board, separate detection on lobby and car lock can be realized. The system protects automatically if abnormal.	Standard
36	Running mode	Inspection running	The operational function used by elevator during inspection or debugging.	Standard

No	Type	Function name	Function instruction	Remark
37		Inspection speed limit	The elevator speed switches to the 50mm/s when the elevator runs at inspection speed to the forced deceleration switch position.	Standard
38		Attendant operation	Select attendant operation by toggling the attendant switch in control cabinet. In attendant operation, door close command can only be output once the close button is pressed manually. When lobby calling is registered, the car buzzer will alarm with corresponding internal command blinking to inform the attendant of the calling. Attendant orientation function is also available	Standard
39		Attendant direction switching	In attendant, by-pass and independent running state, elevator running direction can be changed by pressing up/down button or triggering the DS switch in control cabinet.	Standard
40		Attendant+XPM	If A1-00 is set to 2, the door will close when close button is pressed down and open after released.	Function selection
41		Attendant+by-pass	In attendant state, the elevator will not response to any lobby calling	Standard
42		Full load by-pass	In automatic running state, the elevator will not respond to but will register the passing-by lobby calling signals. Lobby calling command of current floor can make the door open. After reset of full-load signal or when there is no internal calling command, the registered lobby calling command enters calling state automatically; After by-pass switch acts, the lobby calling cannot be registered, the door can only be closed by pressing close button. Attendant orientation is available.	Standard
43		Light load Anti-disturbance function	In LL switch action, if the commands in the car exceed the setting value, the system will clear all internal commands after running once.	Function selection
44		Independent running	The system will enter specific running mode by switching on the independent running switch, and	Function selection

No	Type	Function name	Function instruction	Remark
			the elevator does not register external calling, the door opens automatically when arrives, the door can only be closed by pressing the close button. Attendant orientation function is available.	
45		Lobby calling VIP running	Lobby calling board VIP running function is realized by enabling lobby calling board lock signal, then the elevator will block internal/lobby calling command and run immediately towards the floor triggered by lobby calling VIP signal with the door remaining open. After closing the door manually, respond to internal calling command will exit from lobby calling VIP state automatically.	Function selection
46		Self-rescue leveling run	If the elevator is in non-inspection state and does not stop in the leveling area, the elevator will return to the leveling floor and open the door automatically if safety requirement is reached.	Standard
47		UPS running function	2 optional UPS 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 leveling.	Function selection
48		Automatically return to the home floor	In non-attendant state, automatic returning signal is valid. If there is no command, the elevator will return to the home floor after the set time. The elevator can enter standby by F0_18.	Function selection
49		Lock elevator	In automatic running state, the lock switch acts to clear all lobby calling registers. The elevator runs normally and returns to the home floor after responding to all registered commands in the car. After that, the elevator stops and turn off the light and	Standard

No	Type	Function name	Function instruction	Remark
			fan. The elevator reruns after lock switch is reset.	
50		Fire evacuation operation	In automatic running state, the fire signal acts and the elevator will clear all calling records and run to the home floor at the fastest speed. After that, it outputs fire signal to keep the door open. If the elevator is running reversely, 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. entering fire fighter action by switching the fire switch in control cabinet b. entering fire fighter action automatically after the fire fighter delay time is passed. Select different fire fighter running mode by F0_03, close the door by fire fighter close button (car top command board FRCL).	Function selection
52		Earthquake function	When the input signal which is defined as earthquake acts, the elevator will stop and open at the nearest leveling floor.	Function selection
53		Test run	This function is used in debugging or a fatigue test of a new elevator. Operate the elevator in close mode by F0_16 and block lobby calling.	Function selection
54		Arrival gong	Ring when the elevator is arriving at the door area.	Function
55		Light and fan auto. off in stand-by	When the door is closed and there is no internal command and lobby calling signal, the light and fan will be off automatically after the delay time set by T0_03 is passed. When there is command, the lighting and fan will be turned on automatically.	Function selection
56	Door operator	Door open/close inspection	If the door lock circuit is disconnected, press up/down button to send out close command. When the circuit back to connection, the elevator will run up/down. If the elevator stops at the door area, press the up/down button at the same time will send out door-open	Standard

No	Type	Function name	Function instruction	Remark
			command and the elevator will open the door.	
57		Repeated door open/close	If door is not closed after closing for 20s, the elevator will open the door reversely. After repeating such operation for 5 times, the door will keep closed. If the door closes but the lock fails after closing for 10s, the elevator will open the door reversely. After repeating such operation for 5 times, the door will keep open.	Standard
58		Automatic control in opening time	In non-attendant state, the elevator will open the door automatically when arrived. The opening time can be modified by T0_00.	Function selection
59		Opening delay button	After delay opening button (DOD) is pressed, the elevator keeps the door open in the time set by T0_16 (this parameter is related to multi-function output F0_15=1x, F0.07=1, if modification is needed, set T0_16 to 0), press close button to close the door in advance.	Function selection
60		Lobby 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 door area.	Function selection
62		Pre-close of the closing button	Press closing button in the automatic state to close the door in advance.	Standard
63		Door close/open maintenance function	Set close/open maintenance function according to the types of door operator.	Function selection
64		Service floor setting	Set the stopping floors, door open conditions and non-stop floors by setting the door layout parameters	Function selection
65		Front/rear door service	Set front/rear door service floor by parameter setting	Function selection
66		Vice control cabinet operation	Carries the same button and function with the main control cabinet. F0_09 needs to be set to 0.	Function selection
67		Hand door control	The system can realize hand door control by setting F0_01 to 1, cargo lift function by setting F0_01 to 3 (no need to detect car board)and hand door in	Function selection

No	Type	Function name	Function instruction	Remark
			landing floor electric lock mode by setting it to 9.	
68	Other	LED display	2 LED digit, display floors and fault codes	Standard
69		Dot matrix floor display	Both the lobby and the car adopt dot matrix module to display running direction, current floor and elevator state (such as inspection, overload, fault)	Standard DC-03A
70		Scrolling display of running direction	During running, scrolling display of running direction is available both in the lobby and in the car.	Standard DC-03A
71		Floor displaying character setting	Set the characters (English letters or specific symbols) to be displayed in each floor by setting the parameters.	Function selection
72		Fault history record	The system will record the latest 30 faults, including the fault time, fault code and floor information.	Standard
73		Cancellation of wrong internal command	Pressing the button twice can cancel the internal command. Set F0_16 to 16 to cancel this function.	Standard
74		Automatic number clearance in reverse direction	Select whether to clear the previous reverse direction command by F0_18 when the elevator arrives at the terminal floor or the running direction changes.	Function selection
75		Failure diagnosis of hoistway autotuning	The elevator cannot run without correct hoistway data, so failed autotuning will be followed by failure diagnosis.	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 adjustment	Unified adjustment on leveling precision can be realized by P1.14; separate leveling adjustment on each floor can be realized by PB and PD parameter groups or internal car commands.	Standard
78		Current ramp clearance	In the application of permanent magnet synchronous motor, the maintenance current is cleared through ramp to avoid abnormal noise. The ramp clearance time can be postponed by P5_12.	Standard
79		Strong braking contactor	The braking contactor and strong braking contactor output at the same time. After the set delay, the	Function selection

No	Type	Function name	Function instruction	Remark
			strong braking contactor is closed.	
80		Independent star-delta control	Defining JKM2 as star-delta output to output together with running contactor JKM1 by setting F0_13 to 37, after running contactor is closed, cancel at a delay during stop.	Function selection
81		UCMP detection of subsystem	Realize UCMP detection function of synchronous motor by adopting pre-open board; realized UCMP detection function of asynchronous motor by adopting EC-UCM controller.	

1.3 Software configuration

No	Function name	Function instruction	Remarks
1	Releveling after door opening	The system will level at low speed when passengers enter or get off the elevator.	Configure with EC-RDB
2	Arrival indicator at the lobby	The corresponding arrival indicator will output during elevator leveling and lobby calling orientation to inform passengers of the incoming elevator and running direction. The indicator blinks at 0.5s interval in upward running and 1s interval at downward running until the door lock is connected or orientation is cancelled.	Configure With lobby forecast indicator and relay pinboard
3	Arrival gang at the lobby	Arrival gang is installed in each floor. It rings when the elevator is in the door area. It rings once during upward arrival and twice during downward arrival.	Configure with arrival gang and relay pinboard
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	Floor service control of general/specialized car IC card	There is a card reader in the control cabinet if configuring the function. Passengers can only register the authorized entering commands by swiping the card in the car.	Optional IC card
6	Calling service control of lobby IC	There is a card reader in the calling box if configuring the function. The user can only register the calling command	Optional IC card

No	Function name	Function instruction	Remarks
	card	with a card.	
7	Single door operator and single control cabinet	Default configuration for single door operator	Configure with single control cabinet
8	Single door operator and dual control cabinet	When selecting this layout, it is viable to use 1 piece of EC-CTB and two sets of EC-CCB, the procedures are the same for buttons and lights of main/vice control cabinet. It is required to short circuit BK1 input point of car top board	Configure with dual control cabinet
9	Dual door operator and single control cabinet	This layout is applicable for applications where close/open of only the front door or rear door is needed or both doors need to be opened/closed at the same time(for applications where independent control of front and rear door is needed, please configure with dual control cabinet). The door opens at arrival according to the door layout mode	Configure with single control cabinet
10	Dual door operator and dual control cabinet(independent control of front and rear door)	When selecting this layout, it is viable to use one piece of EC-CTB and two sets of EC-CCB; or two pieces of DC-01 and two sets of CD-02, which can be removed when the floor number is less than 12. The open button or internal command of main control cabinet will open the front door and those of the vice control cabinet will open the rear door. Front door lobby calling opens front door and that of the rear door opens rear door. F0_09 needs to be set to 0.	Configure with dual control cabinet
11	Remote monitoring	Remote monitor the floor position, running direction and fault state in real time	Configure with DM08
12	GPRS remote alarm	After setting and connecting DM-03/04, many value-added functions can be realized such as elevator fault can be reported to the monitoring center and the short message can be sent to the maintainer.	Configure DM-03/04
13	Ethernet real-time monitoring	Monitor elevator running data (sampling at 0.5ms at the fastest) in real time by adding ethernet module PA_DP/E	Configure PA_DP/E
14	Group control running	Support the running of up to 8 elevators	Configure with 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.
	Steps for correct running.

In some situations, neglect of the content in “NOTE” may lead to major accidents, so these important precautions and notes must be followed under any circumstances.

2.2 Reader group

Elevator control design personnel

Elevator maintenance engineer

Technical support

	◆ 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 with the improvement and update of the product. ◆ Please contact our company in the way indicated on the back covers if needed. ◆ The content of this manual is confirmed correct when printing, but our company reserves the right of updating without prior notice.

2.3 Warning marks

	◆ Inspection on the machine must be done after the power supply is disconnected for at least 10 minutes.

The marks are presented on the front cover of EC100.

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 or faulty components and parts, otherwise injury may occur.

Upon unpacking, confirm the following:

1. No damage occurred during transportation. (No damage or scratch to the machine).
2. Information on the product nameplate is in accordance with your order.
3. The optional parts are in accordance with your order. If you find anything wrong, please contact our company immediately.

2.4.2 Disassembly and assembly

	◆ Please install according to the mechanical and electrical installation standards. ◆ Only experienced and trained professionals can carry out the installation. ◆ Read the manual and safety precautions carefully before operation.
	◆ Do move the machine by lifting its base, otherwise it may fall and physical injury may occur. ◆ Mount the device on nonflammable material and keep away from any explosives and inflammable items, otherwise fire and explosion may occur. ◆ The installation position should be free of dripping water or other liquids, otherwise damage to the controller may occur. ◆ The installation platform should be strong enough to sustain the controller, otherwise 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 controller and braking resistor in the same cabinet, otherwise fire or other accident may occur due to overheat. ◆ Make sure no conductive objects or other metallic objects can fall into the controller, otherwise 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 carry out 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 normal after safety circuit is connected, otherwise physical injury may occur. ◆ Do not touch the conductor parts of the terminal directly or connect the output cables with the chassis. Do not short circuit the output cables, otherwise electric shock, short-circuit or fire may occur. ◆ Do not touch the board circuit with hands directly; otherwise damage to the components and parts may occur.
	◆ Ensure the voltage of AV main circuit is in accordance with the rated voltage of the intelligent integrated machine, otherwise electric shock, damage to the controller and fire may occur. ◆ Do not carry out any voltage-withstand test on the controller, otherwise damage to the semi-conductors may occur. ◆ Connect the braking resistor according to the wiring diagram, otherwise fire may occur. ◆ Tighten the screws with the designated torque, otherwise fire may occur. ◆ Only professional technicians are allowed to carry out the design, installation, debugging and operation on the device. ◆ Follow all the warnings, otherwise serious physical injury or death and property loss may occur. ◆ The input power lines must be tightened permanently and the device needs to be grounded with proper techniques. ◆ Dangerous voltage is still present on the following terminals even if the intelligent integrated machine does not work. Power supply terminal R, S and T The connecting terminal U, V and W ◆ Before installation, wait for at least 10 minutes after disconnecting the power supply until the CHARGE light is off and the machine is fully discharged.

2.4.4 Precautions of running

	◆ Switch on the power supply after confirming the installation of terminal covers is completed and do not remove the cover during power connection, otherwise electric shock may occur. ◆ Reset the fault after confirming the running signal is disconnected, otherwise physical injury may occur.

	◆ Do not perform any signal inspection and wrong operation during 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 integrated machine is well set in factory. Do not refit by yourself, especially during 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 protective cover or touch the terminal before disconnecting the main circuit power. Carry out maintenance or inspection after confirming that the bus is voltage is fully discharged, otherwise residue voltage may still 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 to the machine may occur. ◆ Please take off the metal accessories (such as watch and ring) before working and wear insolating clothes and use the insulating tools, otherwise electric shock may occur. ◆ Do not change or remove the terminals or connector during powering on, otherwise electric shock may occur.
	◆ Please operate with caution on the controlling circuit board because there is integrate circuit. ◆ The PCB boards may be damaged because of directly touch by hand due to the static electricity.

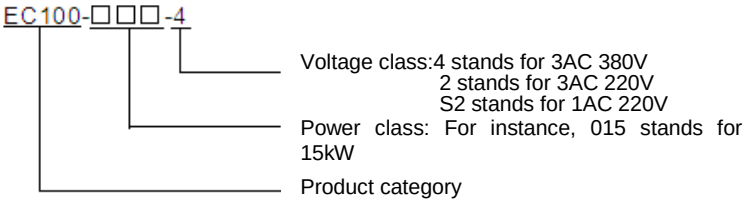
2.4.6 Other precautions

	◆ Do not refit EC100 elevator intelligent integrated machine by yourself; otherwise, electric shock, physical injury and damage to the machine may occur.
	◆ When the life cycle ends, the product should enter the recycling system. Dispose of it separately at an appropriate collection point instead of placing it in the normal waste stream.

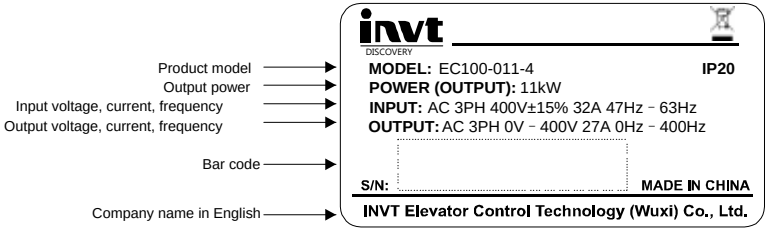
Chapter 3 Product overview

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

3.1 Model description



3.2 Name plate



3.3 Power selection

Model	Rated output power (kW)	Rated output current (A)	Braking unit	Min. braking resistor value
EC100-1R5-S2	1.5	5.5	Built-in	30Ω/400W
EC100-2R2-S2	2.2	11	Built-in	21Ω/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
EC100-018H-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	DBU-055-4	14Ω/11100W
EC100-045-4	45.0	92.0	DBU-055-4	11Ω/13500W

Model	Rated output power (kW)	Rated output current (A)	Braking unit	Min. braking resistor value
EC100-055-4	55.0	115.0	DBU-055-4	9Ω/16500W

Note:

- EC100-1R5-S2 and EC100-2R2-S2 are single phase 220V input, which is suitable for villa elevators.
- Products of other power class are non-standard. Please contact our company directly as needed.

3.4 Technical specifications

Item	Name	Specification
Input/output characteristics	Input voltage	AC380±15%
	Input frequency	47~63Hz
	Output voltage	0~Rated input voltage
	Output frequency	0~400Hz
Basic characteristic of the elevator	Highest floor	64th
	Max. running speed	6m/s
	Group control quantity	8
	Communication mode	CAN communication
Peripheral interface characteristics	Digital low voltage input port	29 input ports, DC 24V/4.5~8mA
	High voltage inspection input port	3 input ports, AC/DC 110V
	Digital output port	12 output ports, DC30V/5A,,AC250V/5A Part of the output ports are controlled via programmable logic: PLC programmable control mode
	CAN communication interface	3 independent CAN communication interfaces
	Encoder interface	Built-in sin/cos, collector NPN output, push-pull output encoder interface
Technical performance	Control mode	PG vector control
	Overload capacity	150% of rated current: 60s

Item	Name	Specification
characteristics		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, UPS mode and hoistway autotuning.
	Stopping mode	Stop based on distance control principles
	Starting torque compensation	Smooth starting without weighing devices. Apply speed loop and position loop
	Master autotuning mode	Static and dynamic autotuning
	Hoistway autotuning mode	Record the position of floor and forced deceleration switch
	Auto-voltage adjustment	Keep the output voltage constant when the grid voltage changes
Operation and monitoring	Operator keypad	2-digit LED, 8 lights and 2 buttons Fault inquiry is available
	Manual operator	Parameters setting, upload, download and fault inquiry and manual calling
	Software of upper PC	Parameters setting, upload, download and fault inquiry, manual calling and curve monitoring

3.5 Delivery confirmation

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 are loose screws.	Check the tightening point with screw drives
4	Open the front cover and check if the control board is loose.	Check the tightening point with screw drives

Please contact us if there is anything wrong.

3.6 Digitron displaying and operation instruction

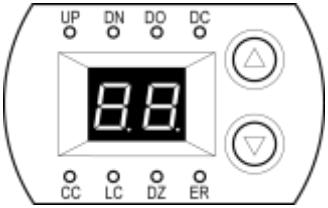


Figure 3-1 Digitron

Instructions of working state:

No	Code	Meaning	Instruction
1	UP	Elevator upward	Keeps on when elevator runs upward
2	DN	Elevator downward	Keeps on when elevator runs downward
3	DO	Door open	Flashes during door opening and keep on when the door fully opens
4	DC	Door closed	Flashes during door closing and keep on when the door is fully closed.
5	CC	Car communication	Keeps on when communication between EC100 and the car is established.
6	LC	Lock indicator	Keeps on when locking
7	DZ	Door area indicator	Keeps on when the elevator is entering the door zone.
8	ER	Elevator fault indicator	Flashes when fault occurred

The LED displays current floor by default when the elevator is in normal state. If fault occurs, Er flashes and LED will flash and report the fault code directly, such as 50. Press UP key to view the previous fault and the fault code will flash; press UP key to view the next fault. Press DOWN key to exit the fault view state and enter the floor displaying state. In the inspection state, if the elevator is leveling, toggling the inspection switch three times consecutively 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℃.

RH ≤ 90%. No condensation is allowed.

3.7.2 Altitude

EC100 will runs at its rated power if the altitude of installation site is below 1000m, if it is above 1000m, the drive power need to be derated. Refer to below figure for more derating details:

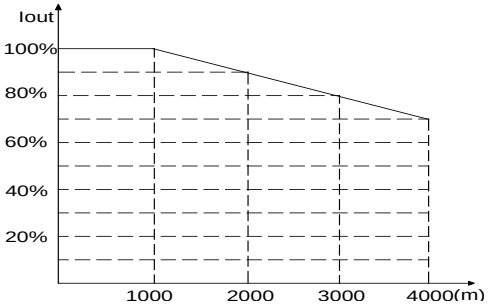


Figure 3-2 Rating curve

3.7.3 Other environmental requirements

Installation site must be:

free from fierce vibration and impact with maximum amplitude less than 5.8m/S2 (0.6g).

away from the electromagnetic radiation source.

free from metallic powder, dust, oil and water.

away from direct sunlight, vapor, oil fog and salt-environment

Chapter 4 Installation and wiring

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

	◆ Follow the guidelines of these manual and only professional electricians are allowed to operate the machine, 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 must 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 to the machine may occur. ◆ Do not connect the wires of braking resistor with the terminals (+) (-) of DC bus, otherwise fire may occur.
	◆ Please confirm the voltage class of the input power is in consistent with that of the machine, otherwise damage to the machine may occur. ◆ All terminals connected with the machine must be tightened enough, otherwise damage to the machine may occur. ◆ Ensure there is no object falling into the machine in the process of configuration and installation, otherwise damage to the machine may occur.

4.1 Dimension and size

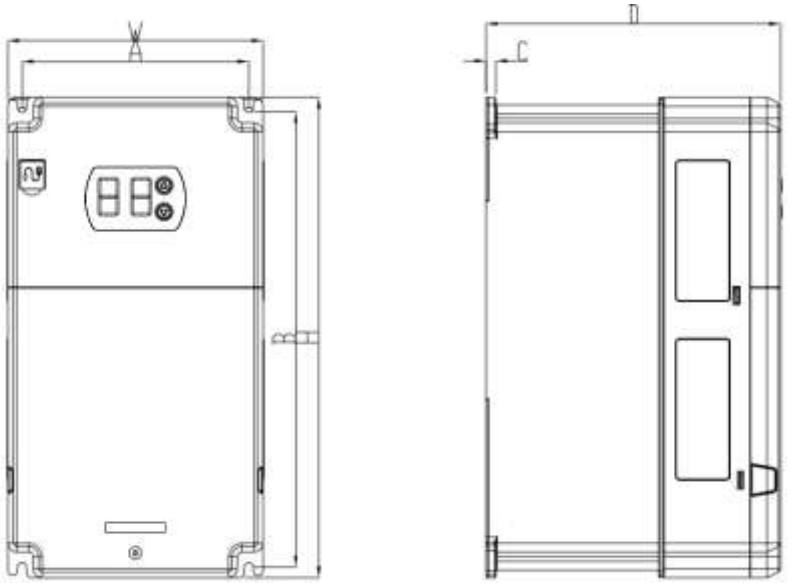


Figure 4-1 Installation dimension of EC100 elevator intelligent integrated machine

Model	W(mm)	H (mm)	D (mm)	A (mm)	B (mm)	C (mm)	Bore diameter (mm)	Screw bolt
EC100-1R5-S2	170	320	197	151	303	6.5	φ6.5	M6
EC100-2R2-S2	170	320	197	151	303	6.5	φ6.5	M6
EC100-004-4	170	320	197	151	303	6.5	φ6.5	M6
EC100-5R5-4	170	320	197	151	303	6.5	φ6.5	M6
EC100-7R5-4	170	320	197	151	303	6.5	φ6.5	M6
EC100-011-4	170	320	197	151	303	6.5	φ6.5	M6
EC100-015-4	230	330	197	210	311	6.5	φ6.5	M6
EC100-018H-4	255	400	226	237	384	10	φ6.5	M6
EC100-022-4	255	400	226	237	384	10	φ6.5	M6
EC100-030-4	255	400	226	237	384	10	φ6.5	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 bottom space should be no less than 100mm to ensure enough cooling.

4.1.1 Terminal instruction

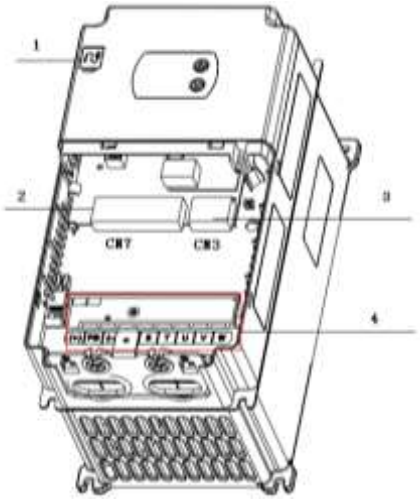


Figure 4-2 Terminals

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

4.2 Main circuit terminals

4.2.1 Terminal arrangement

Figure 4-3 EC100 terminals (7.5kW~18.5kW)

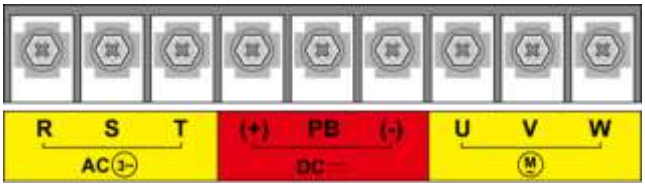


Figure 4-4 Figure 4-3 EC100 terminals (22kW~30kW)

4.2.2 Function instruction

Name	Function
R, S, T	3-phase power input terminals
(+), (−)	DC bus positive 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
EC100-018H-4	16	16	16
EC100-022-4	16	16	16
EC100-030-4	25	25	16
EC100-037-4	25	25	16

Model	Input leads (mm²)	Output leads (mm²)	Grounding leads (mm²)
EC100-045-4	35	35	16
EC100-055-4	50	50	25

4.2.4 Configuration precautions

- The diagrams in this manual are just examples and may be different from the products you ordered.
- Connect according to the terminal mark. Shorten the length to the max. extent to avoid current leakage.
- The power adopts standard 3-phase 5-wire supply. Ground the grounding terminals with proper techniques. It is recommended to use multiple twisted copper wires and ensure the grounding resistor is no more than 4Ω. Grounding cables should be for specific purpose, which cannot be used together with other devices.
- Do not short circuit or ground the input/output circuits.
- The output terminal U/V/W of the machine needs to go through the grounding metal pipe and be routed separately with the signal wires of the control circuit to avoid interference.

4.2.5 Control circuit connection of the intelligent integrated 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 with the heat-releasing. Ensure safety protection and good ventilation when installing braking resistor.

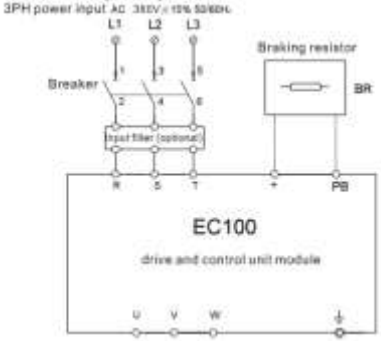


Figure 4-5 Connection diagram of braking resistor and braking unit

◆ (+) and (-) cannot 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:

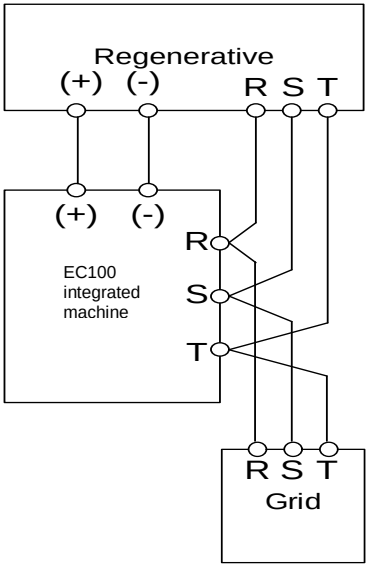


Figure 4-6 Connection diagram of the energy feedback unit

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 must be less than 10Ω. Grounding must be single-point grounding to prevent the grounding cables from forming a circuit.

4.3 Instruction of EC100-I/O board

4.3.1 Appearance and terminal layout of I/O board

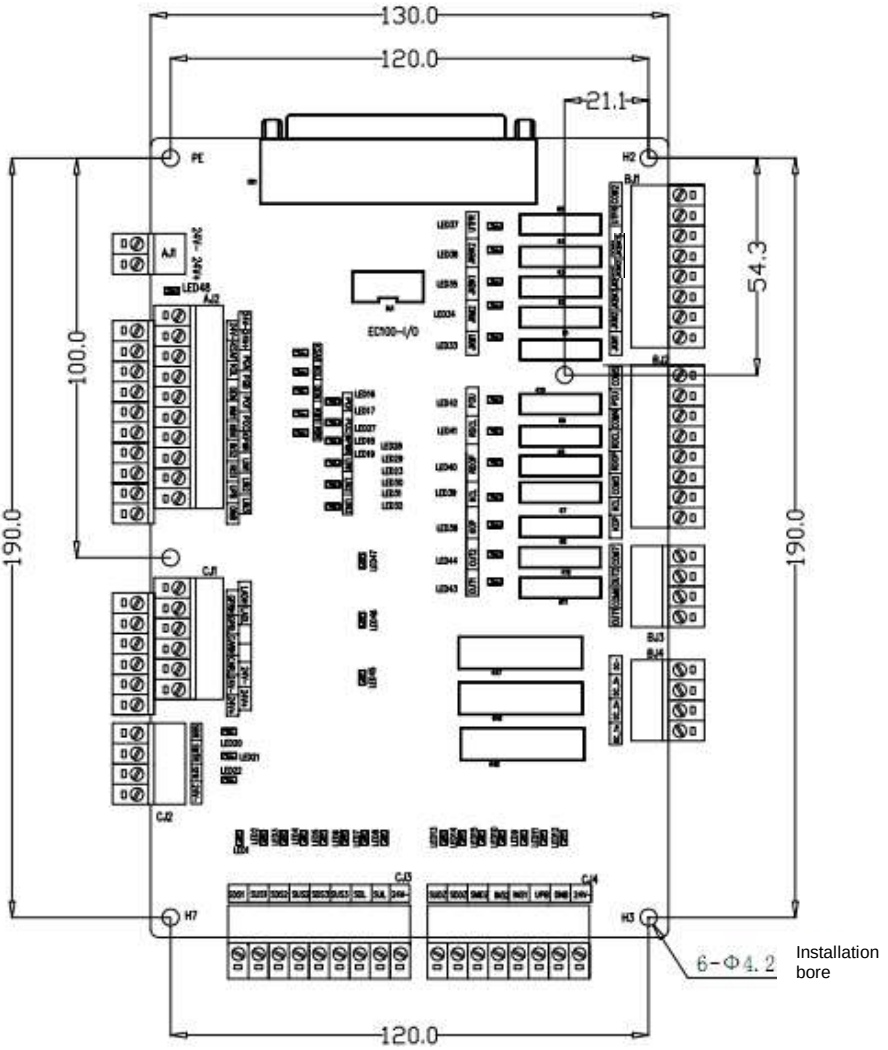


Figure 4-7 Appearance and terminal layout of I/O board

Terminal instruction:

Terminal No	Terminal name	Remark	Terminal No	Terminal name	Remark
CN1	62-core connection terminal		CJ3	Hoistway switch information acquisition interface	
AJ1	Input terminal of DC24V power supply		CJ4	Car /car top signal acquisition interface	
AJ2	Asynchronous PG input terminal Input terminal for inspection within the cabinet Feedback test of the contactor		DJ1	Back-up	
CJ1	Car, group control and lobby calling communication interface		BJ1	Drive part of the contact output control port of the drive part	
CJ2	Fire input		BJ2	Output terminal of door close/open control	
	Motor monitoring interface		BJ3	Output terminal for back-up	
			BJ4	High voltage detection terminal of safety circuit	

4.3.1.1 Terminal definition of I/O board

Plug-in No.	Pin No.	Terminal definition	Code	LED indicator code	Remark
AJ1 terminals 1-2	1	24V power supply -	24V-	LED48 green	Power input
	2	24V power supply +	24V+		
AJ2 upper	1	Encoder power supply 24V-	24V-		Asynchronous master

Plug-in No.	Pin No.	Terminal definition	Code	LED indicator code	Remark
terminals1-10	2	Encoder power supply 24V+	24V+		encoder input Power supply DC24V
	3	Encoder input A phase	PGA		
	4	Encoder input B phase	PGB		
	5	Feedback of advance door-open	POF	LED28	Default NO input
	6	Adhesion detection of advance door-open	POC	LED29	Default NC input
	7	UPS detection	KPWR	LED23	Default NO input (Disabled)
	8	Spare input 1	LIN1	LED30	Default NO input
	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 safety contractor	KSAF	LED16	Default NO input
	3	Contact of door lock contactor	KDL	LED17	Default NO input
	4	Intelligent integrated 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
	7	Emergency electric running(when it is disconnected, it is emergency electric running	INS2	LED10	Inspection signal input of the control cabinet
	8	Inspection signal(when it is off, it is inspection)	INS1	LED9	
	9	Control cabinet inspection UP button input	UPB	LED11	
	10	Control cabinet inspection	DNB	LED12	

Plug-in No.	Pin No.	Terminal definition	Code	LED indicator code	Remark
		DOWN button input			
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		
	5	Car communication power 24V-	24V-		Car and group control communication power
	6	Car communication power 24V+	24V+		
CJ1 upper terminals 1-6	1	Lobby communication LADH	LADH		Lobby calling communication
	2	Lobby communication LADL	LADL		
	3	Null			
	4	Null			
	5	Power supply of lobby calling communication 24V-	24V-		Lobby calling communication power, if load current is more than 2A, select DC24V of switch power.
	6	Power supply of lobby calling communications 24V+	24V+		
CJ2 terminal1-4 pin	1	Brake travel switch detection	SBR	LED20	NC input by default
	2	Motor thermal protection	SMTR	LED21	NO input by default
	3	Fire action input	SFR	LED22	NO input by default
	4	Input common terminal 24V-	24V-		
CJ3 terminals 1-9 hoist-way switch	1	Low speed down forced speed-changing switch	SDS1	LED1	NC input by default
	2	Low speed up forced speed-changing switch	SUS1	LED2	NC input by default
	3	Medium speed down forced speed-changing switch	SDS2	LED3	NC input by default

Plug-in No.	Pin No.	Terminal definition	Code	LED indicator code	Remark
	4	Medium speed up forced speed-changing switch	SUS2	LED4	NC input by default
	5	High speed down forced speed-changing switch	SDS3	LED5	NC input by default
	6	High speed up forced speed-changing switch	SUS3	LED6	NC input by default
	7	Down limit	SDL	LED7	NC input by default
	8	Up limit	SUL	LED8	NC input by default
	9	Input common terminal 24V-	24V-		Input common terminal of hoistway switch signal
CJ4 Car signal interface 1-8	1	Up door area (rear door open detection)	SUDZ	LED13	NO input by default
	2	Down door area	SDDZ	LED14	NO input by default
	3	Middle door area	SMDZ	LED15	NO input by default
	4	Inspection signal 2	INS2	LED10	NC input by default
	5	Inspection signal 1	INS1	LED9	NC input by default
	6	Up inspection button signal	UPB	LED11	NO input by default
	7	Down inspection button signal	DNB	LED12	NO input by default
	8	Car signal input common terminal 24V-	24V-		
BJ1 terminals 1-8	1	Intelligent integrated machine output contactor control 1	JKM1	LED33	
	2	Intelligent integrated machine output contactor control 2	JKM2	LED34	
	3	Brake contactor control 1	JKBK1	LED35	
	4	Brake contactor control 2	JKBK2	LED36	Brake forced
	5	1, 3, 4 pin common terminals	COM1		These two terminals

Plug-in No.	Pin No.	Terminal definition	Code	LED indicator code	Remark
	6	2 pin common terminal	COM0		belongs to the same terminal in old version; REV: COM0 acts as JKM2 common terminal and is separated in A1 and later version
	7	Fire return	1FR	LED37	Fire return output
	8	7 pin common terminal	COM2		
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	Advance door-open 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 (can be set as low speed signal)
	2	1 pin common terminal	COM6		
	3	Customized output 2	OUT2	LED44	Programmable control relay 1 (can be set as UPS output)
	4	3 pin common terminal	COM7		
BJ4 terminals 1-4	1	High voltage input detection of safety circuit	DC_1+	LED45	AC110V/DC110V input
	2	High voltage detection of car door lock	DC_2+	LED46	AC110V/DC110V input

Plug-in No.	Pin No.	Terminal definition	Code	LED indicator code	Remark
	3	High voltage detection of lobby door lock	DC_3+	LED47	AC110V/DC110V input
	4	High voltage detection input common terminal	DC-		

4.3.2 Appearance and terminal layout of EC100- I/O-PA board

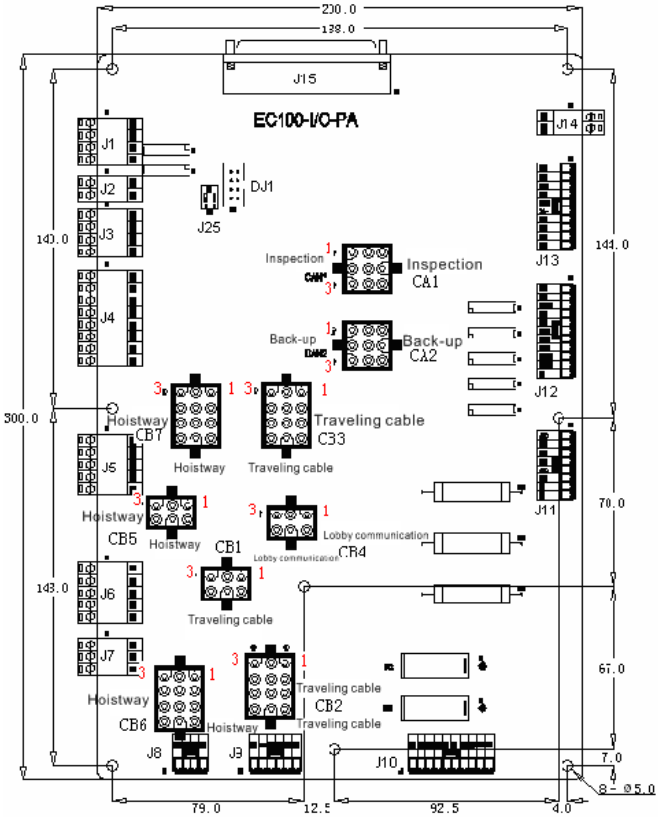


Fig 4-7-2 Appearance and terminal layout of EC100- I/0-PA

Instructions for important terminals:

Terminal NO.	Terminal name	Remark	Terminal NO.	Terminal name	Remark
J1	Asynchronous PG input		J13	Brake, running contactor	

Terminal NO.	Terminal name	Remark	Terminal NO.	Terminal name	Remark
	terminal			adhesion detection; hardware enable detection; safety, door lock detection signal	
J2	Spare output terminal		J14	DC24V working power input terminal	
J3	Fire feedback output, group control interface		J15	DB62 core cable interface	
J4	Fire, thermal protection, UPS, brake switch input terminal		CA1	Inspection box signal within control cabinet	
J5	Spare input terminal		CA2	Spare signal within control cabinet	
J6	Safety circuit signal-upper limit, speed governor, emergency stop of the car, disk wheel signal		CB1	Communication signal in the car	
J7	AC220V lighting		CB2	Lighting power for car top, door operator open/close signal; safety circuit-safety gear, car top inspection, emergency stop of the car, safety, car door lock signal; door operator power	
J8	Intercom signal of the engine room		CB3	Signal in door area; Signal of inspection box on the car top; intercom signal on the car top	
J9	Safety circuit signal-safety, car door lock, lobby door lock, engine room emergency, up signal of engine room		CB4	Lobby calling communication signal	

Terminal NO.	Terminal name	Remark	Terminal NO.	Terminal name	Remark
J10	AC220V input, AC110V input, AC220V output, DC24V output signal		CB5	Lobby calling communication signal of lobby calling protocol	
J11	Safety circuit-A20 terminal		CB6	Bottom pit AC220V lighting power; safety circuit-tensioning wheel, upper limit, lobby door lock, car door lock; bottom pit intercom signal	
J12	Safety circuit-A30, A20 terminal; brake 2 output control; safety circuit-phase sequency, evacuation hand wheel terminal; drive output control; brake 1 output control		CB7	Hoistway-upper/lower limit, upper/lower forced deceleration signal	

4.3.2.1 Terminal definition of EC100- I/O-PA board

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
J1 terminals 1~4	1	Encoder power 24V-	24V-		Asynchronous master encoder interface, DC24V power
	2	Encoder power 24V+	24V+		
	3	Encoder input A phase	PGA		
	4	Encoder input B phase	PGB		
J2 terminals 1~2	1	Customized output common terminal	COM1	LED41	For PLC self-programming
	2	Customized output	OUT		
J3 terminals 1~4	1	Fire return output common terminal	COM2	LED8	
	2	Fire return	UTFR		
	3	Group control CANH	GPRH		Connect during group control
	4	Group control CANL	GPRL		

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
J4 terninals 1~8	1	Input common terminal 24V-	24-	LED34	NO input by default
	2	Fire action input	SFR		
	3	Input common terminal 24V-	24-	LED36	NO input by default (disabled)
	4	UPS detection	KPWR		
	5	Input common terminal 24V-	24-	LED32	NO input by default
	6	Motor thermal protection	SMTR		
	7	Input common terminal 24V-	24-	LED30	NC input by default
	8	Brake travel switch detection	SBR		
J5 terminals 1~4	1	Input common terminal 24V-	24-		
	2	Spare input 3	LIN3	LED15	NO input by default
	3	Spare input 2	LIN2	LED14	NO input by default
	4	Spare input 1	LIN1	LED12	NO input by default
J6 terminals 1~5	1	Empty terminal	NC		
	2	Safety circuit_upper limit switch	A31		
	3	Safety circuit_speed governor	A34		
	4	Safety circuit_ emergency stop of the car	A35		
	5	Safety circuit_disk wheel switch	A38		
J7 terminals 1~3	1	AC220V lighting power	200		Lighting power
	2		201		
	3	Grounding terminal	PE		
J8 terminals 1~4	1	Engine room_intercom signal line 4	PH4		Intercom signal in engine room
	2	Engine room_intercom signal line 3	PH3		
	3	Engine room_intercom signal line 2	PH2		
	4	Engine room_intercom signal line 1	PH1		
J9 terminals 1~6	1	Safety circuit_safety	A22		Safety, door lock short circuit
	2	Door lock circuit_car door lock	A220		
	3	Door lock circuit_lobby door lock	A30		
	4	Safety circuit_L terminal	A10		
	5	Safety circuit_engine room emergency	A46		Emergency electric short circuit

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
	6	Safety circuit_engine room upward running	A40		
J10 terminals 1~10	1	AC220V input terminal	B09	D1	Door operator input power (fuse FU1 input terminal)
	2		B20		
	3	AC110V input terminal	A09	D2	Safety circuit input power (fuse FU2 input terminal)
	4		A20		
	5	Null	NC		
	6	Null	NC		
	7	AC220V output terminal	B10		Door operator power
	8		B20		
	9	DC24V input terminal	24V+		DC2V power input terminal
	10		24V-		
J11 terminals 1~8	1	Safety circuit_N terminal	A20		
	2	Safety circuit_N terminal	A20		
	3	Safety circuit_N terminal	A20		
	4	Safety circuit_N terminal	A20		
	5	Safety circuit_N terminal	A20		
	6	Safety circuit_N terminal	A20		
	7	Null	NC		
	8	Null	NC		
J12 terminal 1~11	1	Door lock circuit_lobby door lock	A30		
	2	Safety circuit_safety	A22		
	3	Brake contactor control 2	JKBK2	LED6 (K3)	Brake forced
	4	Safety circuit_phase sequence	A25		
	5	Safety circuit_evacuation hand wheel	A38		
	6	Output contactor control 1	JKM1	LED1 (K4)	

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
	7	Null	P111		The two terminals are connected together
	8		P111		
	9	Brake contactor control 1	JSQ	LED4 (K5)	The two terminals are connected together
	10		JKBK1		
	11	Null	NC		
J13 terminals 1~10	1	Brake contactor adhesion detection	KBK	LED28	NC input by default
	2	Running contactor adhesion detection	KM1	LED26	NC input by default
	3	Hardware enable detection	DEN	LED7	NO input by default
	4	Door lock contactor adhesion detection	KDL	LED24	NO input by default
	5	Safety contactor adhesion detection	KASF	LED22	NO input by default
	6	Input common terminal 24V-	24-		
	7	Input common terminal 24V-	24-		
	8	Input common terminal 24V-	24-		
	9	Input common terminal 24V-	24-		
	10	Input common terminal 24V-	24-		
J14 terminals 1~2	1	24V power input -	24V-	LED48 green	Power input (DC24V power in J10)
	2	24V power input +	24V+		
CA1 inspection terminal 9-core Inspection box in control cabinet	1	Emergency electric running (when it is off, it is emergency electric running)	INS2	LED35	The first angle position: [top left]
	2	Inspection signal (when it is off, it is inspection)	INS1	LED33	
	3	Engine room up button signal	UPB	LED17	The third angle position (bottom left)
	4	Engine room down button signal	DNB	LED19	
	5	Door lock circuit_emergency electromotion	A46		
	6	Door lock circuit_engine room	A40		

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
		upward running			
	7	Door lock circuit_engine room emergency stop	A25		The 7th angle position:[top right]
	8	Safety circuit_safety	A22		
	9	Empty terminal	NC		The 9th angle position [bottom right]
CA2 spare terminal	1	Input common terminal 24V-	24V-		The first angle position:[top left]
	2	Inspection signal (off is inspection)	INS1	LED33	NC input by default
	3	Brake contactor adhesion detection	KBK	LED28	NC input by default The third angle position:[bottom left]
	4	Brake travel switch detection	SBR	LED30	NC input by default
	5	Safety circuit_L terminal	A10		
	6	Safety circuit_Evacuation hand wheel	A38		
	7	Safety circuit_ safety	A22		The 7th angle position:[top right]
	8	Door lock circuit_car door lock	A220		
	9	Door lock circuit_lobby door lock	A30		The 9th angle position:[bottom right]
CB1 terminal 6-core Travelling cable	1	Car communication CARH	A		A: first angle position:[top right] Note: When J25 toggle switch is in off position, adopt external protocol (DJ1 needs to be added with CAN conversion board)
	2	Car communication CARL	B		
	3	Car communication power 24V-	24V-		The third angle

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
					position:[top left]
	4	Car communication power 24V+	24V+		The fourth angle position:[bottom right]
	5	Grounding terminal	PE		
	6	Null	NC		The sixth angle position: [bottom left]
CB2 terminal 12-core Travelling cable	1	Grounding terminal	PE		The first angle position:[top right]
	2	Car top AC220V lighting power	200		
	3		201		The third angle position:[top left]
	4	Door open	DO	LED11 (K6)	
	5	Door close	DC	LED13 (K7)	
	6	Safety circuit_safety gear	A34		
	7	Safety circuit_car top inspection	A40		
	8	Safety circuit_emergency car stop	A35		
	9	Safety circuit_safety	A22		
	10	Door lock_car door lock	A220		The 10^{th} angle position:[bottom right]
	11	AC220V door operator power	B10		B20: the 12^{th} angle position:[bottom left]
	12	Grounding terminal	PE		The first angle position:[top right]
CB3 terminal 12-core Travelling cable	1	Door open/close output common terminal	DCM		
	2	Input common terminal 24V-	24V-		
	3	Upper door area	SUDZ	LED9	NO input by default (the third angle position:[top left])
	4	Lower door area	SDDZ	LED10	NO input by default

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
	5	Middle door area	SMDZ	LED21	NO input by default
	6	Inspection signal (off is inspection)	INS1	LED33	NC input by default
	7	Car top up button signal	UPB	LED17	NO input by default
	8	Car top down button signal	DNB	LED19	NO input by default
	9	Car top_intercom signal line 1	PH1		
	10	Car top_intercom signal line 2	PH2		The 10th angle position:[bottom right]
	11	Car top_intercome signal line 3	PH3		
	12	Car top_intercom signal line 4	PH4		The 12th angle position:[bottom left]
CB4 terminal 6-core Lobby calling communication	1	Lobby calling communication LADH	LADH		The first angle position: [top right]
	2	Lobby calling communication LADL	LADL		
	3	Lobby calling communication power 24V-	24V-		The third angle position: [top left]
	4	Lobby calling communication power 24v+	24V+		The fourth angle position: [bottom right]
	5	Grounding terminal	PE		
	6	Null	NC		The sixth angle position:[bottom left]
CB5 terminal 6-core Lobby calling communication [for external communication purpose]	1	Lobby calling communication CARH (external)	A		The first angle position:[top right]
	2	Lobby calling communication CARL (external)	B		Note: When CB5 plug-in is used, J25 toggling switch must be in OFF position, adopt external protocol (DJ1 needs to be added with CAN conversion board)
	3	Lobby calling communication power 24V-	24V-		The third angle position: [top left]

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
	4	Lobby calling communication power 24V+	24V+		The fourth angle position: [bottom right]
	5	Grounding terminal	PE		
	6	Null	NC		The sixth angle position:[bottom left]
CB6 terminal 12-core Hoistway cable	1	Bottom pit AC220V lighting power	200		The first angle position:[top right]
	2		201		
	3	Safety circuit_tensioning wheel	A46		The third angle position:[top left]
	4	Safety circuit_L terminal	A10		
	5	Safety circuit_upper limit	A31		
	6	Door lock circuit_lobby door lock	A30		
	7	Door lock circuit_car door lock	A220		
	8	Bottom pit_intercom signal line 1	PH1		
	9	Bottom pit_intercom signal line 2	PH2		
	10	Bottom pit_intercom signal line 3	PH3		The 10^{th} angle position: [bottom right]
	11	Bottom pit_intercom signal line 4	PH4		
	12	Grounding terminal	PE		The 12^{th} angle position: [bottom left]
CB7 terminal 12-core Hoistway cable	1	Input common terminal 24V	24V-		The first angle position:[top right]
	2	Up limit switch	SUL	LED31	NC input by default
	3	Low speed up forced speed-change	SUS1	LED18	The third angle position:[top left] (NC input by default)
	4	Down limit switch	SDL	LED29	NC input by default
	5	Low speed down forced speed-change	SDS1	LED16	NC input by default
	6	Medium speed up forced	SUS2	LED23	NC input by default

Plug-in NO.	Pin	Terminal definition	Code	LED indicator code	Remark
		speed-change			
	7	Medium speed down forced speed-change	SDS2	LED20	NC input by default
	8	High speed up forced speed-change	SUS3	LED27	NC input by default
	9	High speed down forced speed-change	SDS3	LED25	NC input by default
	10	Empty terminal	NC		The 10th angle position:[bottom right]
	11	Empty terminal	NC		
	12	Empty terminal	NC		The 12th angle position:[bottom left]

4.3.3 Technical specification of digital input signal

Input mode		Open-circuit input phtotoelectric 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

4.3.4 Technical specification of relay digital output

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 Wiring of asynchronous master encoder

When using asynchronous master, please use the encoder with DC24V power and push-pull or open collector output. The interface of the encoder will be connected with AJ2 of I/O board, which is shown as below:

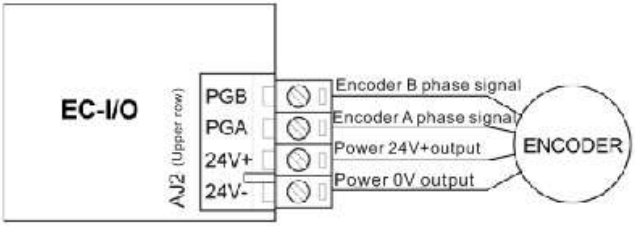


Figure 4-8 Wiring of asynchronous master encoder

4.4.2 Wiring of synchronous master encoder

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

- Sin/cos encoder: It is recommended to install HEIDENHAIN ERN1387 encoder;
- 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 weighing compensation devices.

The wiring diagram of the synchronous master encoder is shown as below:

PIN	SIN/COS	UVW	ENDAT	1387 encoder DIL (Used in EC100 and EC160)		1313 encoder DIL (Used in EC160 (need PG card))	
1	B-	B-	A+	5a	B-	2a	A+(COS+)
2	Null	Null	A-			5b	A-(COS-)
3	R+	Z+	B+	4b	R+(Z+)	4a	B+(SIN+)
4	R-	Z-	B-	4a	R-(Z-)	3b	B-(SIN-)
5	A+	A+	Data+	6b	A+	6b	Data+
6	A-	A-	Data-	2a	A-	1a	Data-
7	0V	0V	Null	3a~5b	0V		
8	B+	B+	Null	3b	B+		
9	5V	5V	Null	7a~1b	5V		
10	C-	U-	Null	1a	C-(SIN-)		
11	C+	U+	Clk+	7b	C+(SIN+)	2b	Clk+
12	D+	V+	Clk-	2b	D+(COS+)	5a	Clk-
13	D-	V-	5V	6a	D-(COS-)	1b	5V
14	Null	W+	0V			4b	0V
15	Null	W-	Null				

Figure 4-9 SIN/COS and UVW encoder wiring diagram

	◆ Please select the twisted shield pairs and the shield level can only be grounded with one side. ◆ Avoid the power cables during wiring, and shorten the length of the cable to the max. extent and make it go through the grounding metal pipes.

4.5 Installation and wiring of the system

4.5.1 Electrical installation of the hoistway

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

For 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 elevator with speed of 1.75m/s~2.0m/s; Install SDS3 and SUS3 for elevator with speed more than 2.0m/s. (in order to avoid impact under high speed running, bitable magnetic switch is adopted). 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 releveling function. These three switches should be installed vertically on the upper, middle and lower part respectively with SMDZ in the middle. When the car is leveling, the plates arrive at the position of three leveling switches at the same time.

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

4.5.2 Installation position of the hoistway switch

See the table below for the switch installation distance. Refer to fig 4-10 for switch installation mode. Adjust according to the operator during debugging.

Rated speed / Forced DEC distance	≤0.4m/s	≤1.0m/s	≤1.5m/s	≤1.75m/s	≤2.0m/s	≤2.5m/s	≤3.0m/s
L1 force deceleration distance at low speed	0.2m	0.8m	1.6m	2.2m	1.6m	1.6m	1.6m
L2 force deceleration distance at medium speed					2.8m	2.8m	2.8m
L3 force deceleration distance at high speed						4.3m	6.0m

SDS1-Low speed down forced DEC switch SUS1-Low speed up forced DEC switch

SDS2-Medium speed down forced DEC switch SUS2-Medium speed up forced DEC switch

SDS3-High speed down forced DEC switch SUS3-High speed up forced DEC switch

SDL-Down limit switch SUL-Up limit switch

SDFL-Down limit switch SUFL-Up limit switch

	◆ Note that the plugging depth of the plate is up 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. ◆ Ensure that no conductive objects such as metal falls into the controller, otherwise fire and damage to the controller may occur.
	◆ The position of low speed forced DEC switch should be able to allow the elevator to act when stopping at terminal station and do not act at non-terminal station. Based on national standards, when the elevator presses against the buffer, low speed forced DEC switch still acts. ◆ Above table lists recommended position of forced DEC switches corresponding to common elevator speed, the concrete condition should depend on debugging and is closely related to terminal floor height, starting speed-up step curve and effective length of saltando. For instance, if the saltando of the 1.75m/s elevator is not long enough, change L1 to 1.2m and L2 to 2.2m; If the height of the 1.0m/s elevator ground floor is 0.7m and the others floors are 3m, then the ground floor should be installed with two DEC switches which is L1=0.3m and L2=0.8m, while the top floor only needs to be installed with one 0.8m DEC switch. When the elevator speed up to V to run to the first DEC switch at the whole target distance, then the distance between this switch and terminal leveling line is L=0.61×V2+0.2×V.

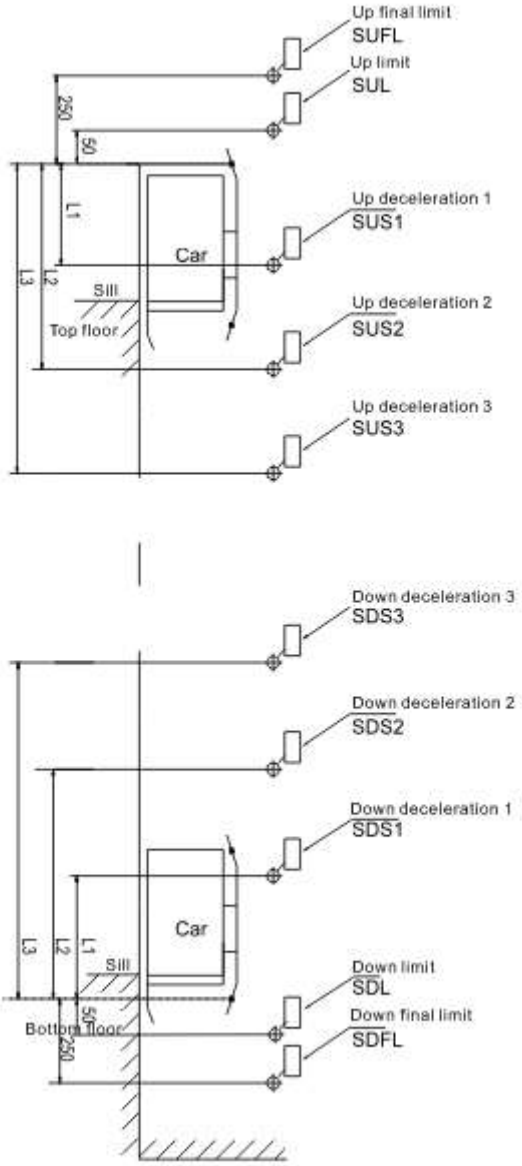


Figure 4-10 Installation position of the hoistway switch

4.5.3 Connection diagram of peripheral devices in control system

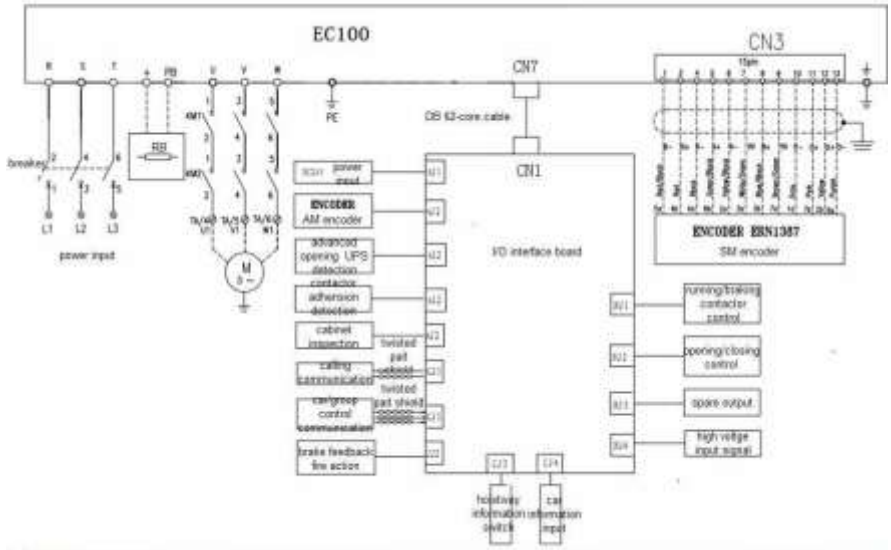


Figure 4-11 Connection diagram of peripheral devices in control system

4.5.4 Connection precautions

4.5.4.1 Power supply

The voltage of the power supply must be in consistence with the rated voltage of the machine

The fluctuation range should be less than 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 (Optional)

Purpose: Improve the power factor of the power supply and reduce the harmonic current by AC reactor.

4.5.4.4 Filter at the input side (Optional)

Purpose: Suppress the high frequency noise interference caused by the machine cable to the power supply.

4.5.4.5 Output contactor in the main circuit

Purpose: Control the current flow of the tractor. It is recommended to install two contactors between the drive device and tractor motor. Refer to the electrical diagram for more details.

4.5.4.6 Filter at the output side

Purpose: Suppress the noise interference and the current leakage caused by output side of the machine.

4.5.4.7 AC reactor at the output side

Purpose: Suppress the RF interference.

4.5.5 CAN communication configuration

There are 4 cables for communication in the hoistway and traveling cable. The lobby 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 these 4 cables and others before powering on, especially the power cable of 24V, 36V, 110V, 220V, 380V or other power cables.

The switch power provides 24V power to each branch point (branch point includes the controller on top of the car, car controller, car display and each calling box controller). The cable diameter is equal to or more than 0.75mm^2. For higher floors (above 25th floor), it is necessary to reduce voltage drop and ensure the farthest lobby calling power voltage is no less than 20V.

Twisted-pair specifications: Characteristic impedance 120Ω; 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 between them to prevent power interface. If the layout space is limited to meet such requirement, then shielded twisted pairs should be adopted and the shielded cable should be grounded on one side only.

Grounding of hoistway cable and traveling cable: For hoistway cable and traveling cable, please note that the strong wire (including door operator power, safety circuit, door lock circuit, lighting circuit, etc) should be separated from weak wire (including communication cable, DC 0V, DC24V, leveling reed, terminal forced DEC switch, terminal limit switch). The communication cable must adopt twisted pairs with twist distance less than 30mm. If possible, it is recommended to adopt shielded twisted pairs cable with the shielded layer being grounded.

	◆ If the strong wire and weak wire are configured in parallel, put the strong ones together on one side and the weak ones together on the other side. Use grounding wires to separate them.
	◆ Do not plug/unplug the CAN bus plug (24V＋, 24V－, CANH and CANL)when power on, otherwise permanent damage to the components may occur. ◆ Abnormal communication may occur if CAN communication terminal resistors are set incorrectly.

	◆ In general, the resistance between CANH and CANL is about 60Ω.
	◆ CAN communication cable must be twisted pair and the twist distance is less than 30mm. ◆ CAN bus communication cable should be away from strong wire; the communication power cable, communication cable and strong wire circuit wire cannot be twisted into one group of cable. ◆ CAN communication cable cannot be connected with other circuit or grounding wire. ◆ The CAN communication power cable should be for specific purpose, which means it cannot be used for any other purposes or connect with other loads, and it should be separated from 24V power of the controller. ◆ The lobby/car calling board is collector open-drain output and is applicable only for loads such as LED. If the elevator is made from old ones whose button indicator is bulb-type, please 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 equipment.

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 cannot be changed.

The EMC capacity of different electrical and electronic devices is also different due to the differing EMC standards or grades.

4.6.2 EMC features of drive

Like other electric or electronic devices, the drive is not only an electromagnetic interference source but also an electromagnetic receiver. The operating principle of drive determines that it can produce certain electromagnetic interference noise. And the same time drive 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 drive and influence the normal using of customers.
- In the system, EMS and EMI of drive coexist. Decrease the EMI of drive 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 drive, 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 drive. 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 drive, which greatly decreases or loses the shielding effect.

Connect drive 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 On-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 drive, 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 drive, 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

The drive 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 drive. The over-ground leakage current, which is the current passing through the common ground wire, can not only flow into drive 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 drive, the length and section areas of motor cables. The higher carrier frequency of drive, 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 Noise Filter

Noise filter has a great effect of electromagnetic decoupling, so it is preferred for customer to install it. The noise filter has following categories:

- Noise filter installed at the input side of drive;
- Install noise filter or isolation transformer at the input ends of other devices.

4.6.4 Installation specification

If user install the drive and EMI filter according to the installation guideline, then following standards can be met:

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

Chapter 5 Debugging tools

5.1 Instruction

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

5.1.1 Main monitoring interface

Following elevator state can be viewed through LCD display:

- The automotive, inspection, attendant, 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

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

5.1.3 Parameters setting

All the elevator parameters can be set through the manual operator

- 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

Autotuning related to the elevator can be conducted via manual operator:

- Hoistway autotuning
- Static autotuning of the motor
- Rotary autotuning of the motor
- Weighing autotuning

5.1.6 Data management

- Data storage
- Factory setting restore
- Fault history clearance

5.2 Connection method

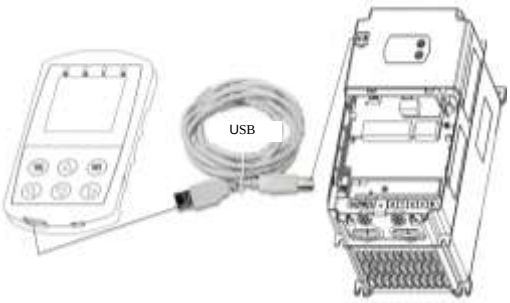
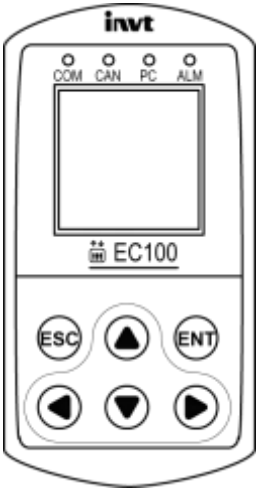


Figure 5-1 Connection of manual operator interface with EC100

5.3 Manual operator keys and LED indicator

5.3.1 Manual operator key definition



NO.	Symbol	Instruction
1	ESC	Exit/return to previous menu
2	▲	Increasing menu name or parameter value/ up
3	▼	Decreasing menu name or parameter value/down
4	◀	Shift to left parameter value
5	▶	Shift to right parameter value
6	ENT	Enter next menu/confirm current operation

Figure 5-2 Appearance and key definition

5.3.2 Definition of manual operator LED indicator

No.	No.	Meaning	Instruction
1	COM	Indicator of connection between manual operator and EC100	Keeps on when communication is normal
2	CAN	Indicator of connection between manual operator and the car	Keeps on when communication is normal

No.	No.	Meaning	Instruction
3	PC	Indicator of connection between manual operator and the computer	Keeps on when communication is normal
4	ALM	Communication connection fault indicator	Flashes when there is no communication

5.4 Operational procedure flowchart

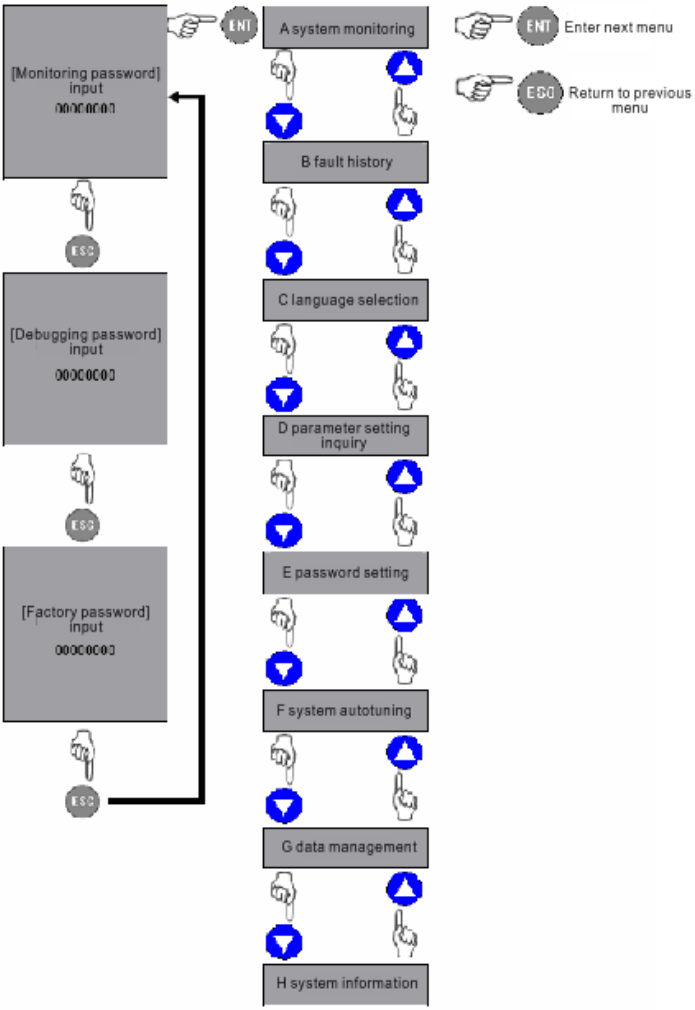


Figure 5-3 Procedure flowchart of manual operator

5.5 Simple manual operator

5.5.1 Overview of simple manual operator

The simple manual operator (hereafter referred as operator) consists of 5 digit tube, 7 LED indicators and 8 keys. As the basic debugging tool, it has many basic functions such as parameter setting, fault inquiry, running monitoring, factory authorization, manual calling. The diagram is shown as below:

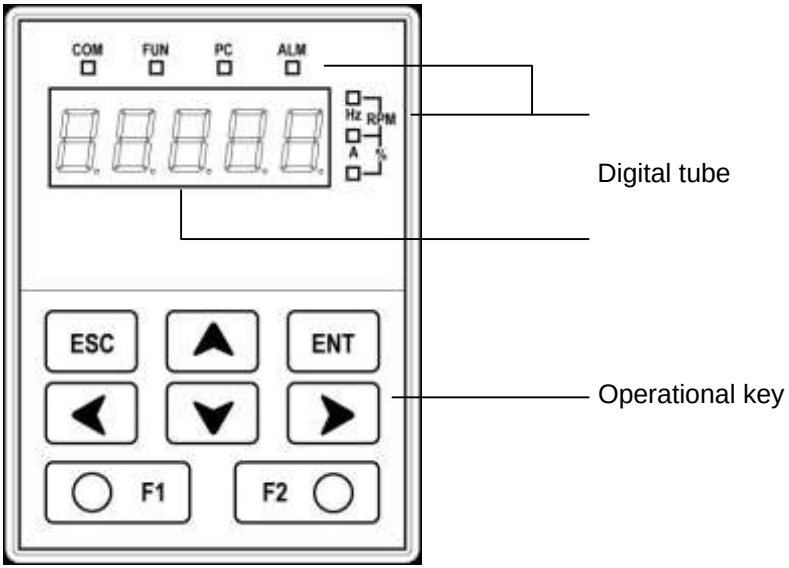


Fig 5-4 Diagram of the operator

5.5.2 Instruction of operational keys

NO.	Symbol	Description
1	ESC	Return to previous menu or monitor the switching between menus
2	ENT	Enter next menu or parameter and password setting
3	▲	Increasing parameter name and parameter value or view read-only parameter value by sequence.
4	▼	Decreasing parameter name and parameter value or view read-only parameter value by sequence.
5	◄	In parameter setting or password interface, move the cursor leftward.
6	►	In parameter setting or password interface, move the cursor rightward.
7	F1	In password entry interface, enter password read-only state by this key
8	F2	After entering the correct password, enter quick parameter debugging interface by this key.

9	▲+▼	Pressing these two keys and then power up, enter upper monitor authorization and inquiry mode.

5.5.3 Indicator instructions

NO.	Symbol	Description
1	COM	Turns on when the communication between the operator and EC100 is normal
2	FUN	Turns on when view the setting or the monitored parameter is speed.
3	PC	Turns on when the communication between the operator and PC is normal
4	ALM	Turns on when the operator does not establish any communication
5	Hz	Turns on when viewing settings or the monitoring parameter is frequency.
6	A	Turns on when viewing settings or the monitoring parameter is current.
7	V	Turns on when viewing settings or the monitoring parameter is voltage.
8	Hz+A	Turns on when viewing settings or the monitoring parameter is rotating speed.
9	A+V	Turns on when viewing settings or the monitoring parameter is percentage.

5.5.4 Segment reference of digital tube

Displayed segment						
Corresponding instruction	0	1	2	3	4	5
Displayed segment						
Corresponding instruction	6	7	8	9	A	b
Displayed segment						
Corresponding instruction	C	d	E	F	H	L
Displayed segment						
Corresponding instruction	N	o	P	r	t	U
Displayed segment						
Corresponding instruction	Total number of AL	No: NO.	Er: Error code	FL: Floor	NON: No fault record	
Displayed segment						
Corresponding instruction	SEC: Fault time (in seconds)		StEnd: Weighing study succeeded		StErr: Weighing study failed	

5.5.5 Operational process

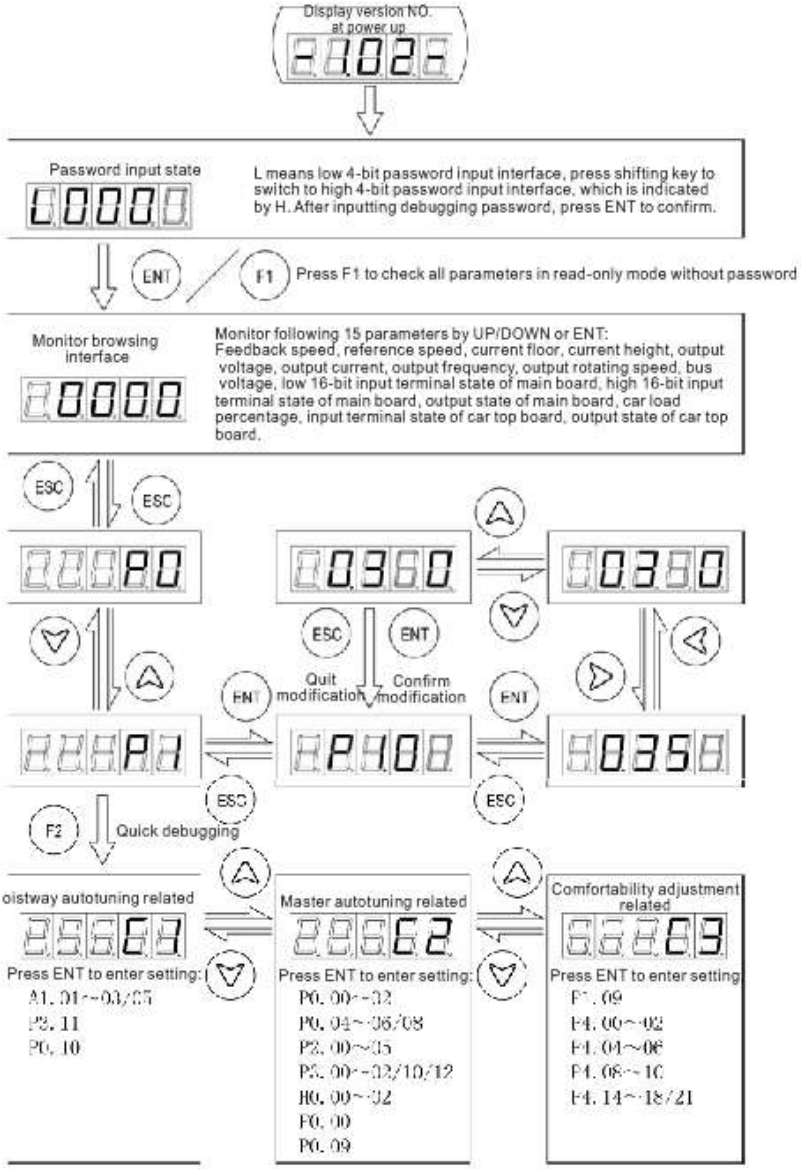
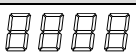
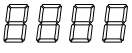
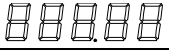
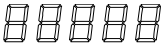
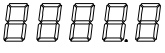
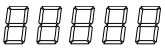
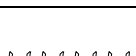


Fig 5-5 Process diagram for the operator

5.5.6 Instruction for monitoring and browsing

NO.	Parameter name	Displaying format	Detailed instruction
1	Feedback speed		Unit: mm/s, turns on FUN light
2	Reference speed		Unit: mm/s, turns on FUN light
3	Current floor		Physical floor number
4	Current height		Unit: m
5	Output voltage		Unit: V, turns on V light
6	Output current		Unit: A, turns on A light
7	Output frequency		Unit: Hz, turns on Hz light
8	Output rotating speed		Unit: rpm, turns on A and Hz light
9	Bus voltage		Unit: V, turns on V light
10	Low 16 bit of main board Input terminal state		SUL SDL SUS3 SDS3 SUS2 SDS2 SUS1 SDS1 KSAF SMDZ SDDZ SUDZ DNB UPB INS2 INS1
11	High 16 bit of main board Input terminal state		A22 KPWR SFR SMTR SBR KBK KM1 KDL LIN3 LIN2 LIN1 POC POF DEN A220 A30
12	Main board output Terminal state		RKOP KCL KOP 1FR JKBK JKBK1 JKM2 JKM1 N/A N/A N/A N/A OUT2 OUT1 POU RKCL
13	Car load		It is necessary to add analog weighing device
14	Car top board input Terminal state		SE CB OB DCL DOL OL PAS ATT FRCL RDCL RDOL IND DS RSE FL LL
15	Car top board output Terminal state		DODL PASL DO DC BK2 BK1 KLS CHM N/A N/A N/A CHML RDO RDC OBL CBL

5.5.7 Parameter table of the operator

Function code	Name	Parameter range and instruction	Default value
P0 group: Motor drive control			
P0.00	Speed control mode	0: Vector control without PG 1: Vector control with PG 2: V/F control	1
P0.01	Rated elevator speed	0.100~6.000m/s	1.750
P0.02	Max. elevator speed	0.100~P0.01m/s	1.750
P0.03	Max. output frequency	10.00~400.00Hz	27.80
P0.04	Diameter of traction sheave	100~2000mm	400
P0.05	Reduction ratio	1.00~100.00	1.00
P0.06	Suspension ratio of hoist rope	1~8	2
P0.07	Carrier frequency setting	1.0~16.0kHz	6.0
P0.08	Running direction selection	0: Running at the default direction 1: Running at the contrary direction	0
P0.09	Motor autotuning	0: No operation 1: Rotating autotuning 2: Static autotuning	0
P0.10	Hoistway autotuning	0: No operation 1: Hoistway autotuning	0
P0.11	Weighing autotuning of car	0: No operation 1: Light load autotuning 2: Full load autotuning 3: Overload autotuning	0
P0.12	Data management operation	0: No operation 1: Controller data save at power off 2: Restore to default value 3: Clear fault record	0
P0.13	Back-up	0~2	0
P0.14	Back-up	0~65535	0
P0.15	Back-up	0~65535	0
P01 group: Speed curve adjustment			
P1.00	Increasing acceleration 1	0.001~1.000m/s^3	0.350
P1.01	Increasing acceleration 2	0.001~10.000m/s^3	0.350
P1.02	Acceleration	0.001~1.000m/s^2	0.700
P1.03	Decreasing deceleration 1	0.001~10.000m/s^3	0.350

Function code	Name	Parameter range and instruction	Default value
P1.04	Decreasing deceleration 2	0.001~10.000m/s^3	0.350
P1.05	Deceleration	0.001~1.000m/s^2	0.700
P1.06	Door area range	0~1000mm	200
P1.07	Zero speed threshold	0~0.050m/s	0.000
P1.08	Low speed threshold for advance door-open	0~0.200m/s	0.050
P1.09	Inspection speed	0~0.630m/s	0.200
P1.10	Creeping leveling speed	0~0.200m/s	0.030
P1.11	UPS running speed	0~1.000m/s	0.100
P1.12	Speed of returning-to-leveling	0~1.000m/s	0.200
P1.13	Autotuning speed	0~1.000m/s	0.100
P1.14	Leveling precision adjustment	0~100mm	50
P1.15	Decreasing-deceleration of creeping	0~10000mm/s^3	200
P1.16	High speed current loop proportional coefficient	0~65535	0
P1.17	High speed current loop integral coefficient	0~65535	0
P20 group: Motor parameter			
P2.00	Motor type selection	0: Asynchronous motor 1: Synchronous motor	1
P2.01	Rated motor power	0.1~150.0kW	Depend on model
P2.02	Rated motor frequency	3.00Hz~400.00	50.00
P2.03	Rated motor speed	1~30000rpm	1440
P2.04	Rated motor voltage	0~460V	380
P2.05	Rated motor current	0.1~1000.0A	Depend on model
P2.06	Motor stator resistor	0.001~65.535Ω	Depend on model
P2.07	Motor rotator resistor	0.001~65.535Ω	Depend on model
P2.08	Inductance of motor stator and rotor	0.1~6553.5mH	Depend on model

Function code	Name	Parameter range and instruction	Default value
P2.09	Mutual inductance of motor stator and rotor	0.1~6553.5mH	Depend on model
P2.10	Motor no-load current	0.01~655.35A	Depend on model
P2.11	Reserved	0~65535	0
P2.12	Reserved	0~65535	0
P03 group: Encoder parameter			
P3.00	Encoder type selection	0: Incremental encoder 1: SIN/COS encoder 2: UVW encoder 3: ENDAT encoder	1
P3.01	Encoder resolution	1~10000	2048
P3.02	Encoder direction	0: Forward input 1: Reverse input	0
P3.03	Low speed encoder offline Detection time	0.1~10.0s 0.0: No detection	1.0
P3.04	High speed encoder offline Detection time	0.1~10.0s 0.0: No detection	1.0
P3.05	Reverse direction detection time of encoder	0.1~10.0s 0.0: No detection	1.0
P3.06	Magnetic pole position amplitude gain	0.50~1.50	1.00
P3.07	C phase magnetic pole bias	0~9999	395
P3.08	D phase magnetic pole bias	0~9999	395
P3.09	Initial position of magnetic pole	0.00~360.00	0.00
P3.10	Static identification current	10.0%~200.0%	50.0
P3.11	Pulse counting direction	0~7 0: Direction of counting value does not change 2: Reverse the synchronous counting direction 4: Reverse the synchronous counting direction	0

Function code	Name	Parameter range and instruction	Default value
P3.12	1387 encoder CD phase line position	0~65535 0: CD phase forward detection 0: CD phase reverse detection	0
P047 group: Running comfortability			
P4.00	ASR low speed proportional gain	0~100	20
P4.01	ASR low speed integral time	0.01~10.00s	0.5
P4.02	Speed detection Low speed filter times	0~8	0
P4.03	Switch low point frequency	0.00Hz~P4.07	2.00
P4.04	ASR high speed proportional gain	0~100	20
P4.05	ASR high speed integral time	0.01~10.00s	0.60
P4.06	Speed detection High speed filter times	0~8	0
P4.07	Switch high point frequency	P4.03~P0.03	5.00
P4.08	Current loop proportional coefficient P	0~65535	2000
P4.09	Current loop integral coefficient I	0~65535	1000
P4.10	Current loop filter coefficient	0~65535	1
P4.11	Slip compensation of drive side	50~200%	100
P4.12	Slip compensation of braking side	50~200%	100
P4.13	Upper limit setting of the torque	0.0~200.0%	150.0
P4.14	Load compensation action	0: Do not act 1: Act	1
P4.15	Load compensation time	0.000~5.000s	0.700
P4.16	Load compensation reducing time	0.000~5.000s	0.300
P4.17	Load compensation proportional gain	0~100	30
P4.18	Load compensation integral time	0.01~10.00s	0.16
P4.19	Position loop APR proportional gain	0~100	0
P4.20	Position loop APR differential time	0.01~10.00s	0.01
P4.21	Current compensation coefficient	-1000~4000	1500
P4.22	Rated load capacity	0~10000kg	1000

Function code	Name	Parameter range and instruction	Default value
P4.23	Input selection of weighing switch	0: Digital 1: Car analog 1: Engine room analog	0
P4.24	Input channel of weighing compensation	0: No compensation 1: Communication input 2: Terminal input	0
P4.25	Pre-torque bias	0.0~100.0%	45.0
P4.26	Bias gain of braking side	0.000~5.000	2.000
P4.27	Bias gain of drive side	0.000~5.000	2.000
P4.28	Car weighing analog filter	0.00~0.50s	0.10
P4.29	Engine room weighing analog filter	0.00~0.50s	0.10
P4.30	Curve smoothing filter time	0~20ms	6
P4.31	Selection of monitoring output	0~65535	0
P05 group: Elevator protection parameter			
P5.00	Input phase loss protection	0: Protection prohibited 1: Always protect 1: Protect during running	1
P5.01	Output phase loss protection	0: Protection prohibited 1: Protection allowed	1
P5.02	Motor overload protection selection	0: No protection 0: Regular motor 2: Frequency-conversion motor	2
P5.03	Motor overload protection current	20.0%~120.0%	100.0
P5.04	Overload pre-alarm point	20.0%~150.0%	130.0
P5.05	Overload pre-alarm selection		0
P5.06	Overload pre-alarm delay time	0.0~30.0s	5.0
P5.07	Automatic fault reset times	0~3	3
P5.08	Interval time of fault reset	0.1~100.0s	5.0
P5.09	Protection value of speed deviation	0.1%~50.0%	30.0
P5.10	Allowed time of speed deviation	0.000~10.000s	1.000
P5.11	Braking threshold voltage	320.0~750.0V	700.0
P5.12	Ramps current cancellation delay	0~65535ms	0
P5.13	High speed elevation enabling	0~65535	0

Function code	Name	Parameter range and instruction	Default value
P06 group: Communication setting (reserved)			
P07 group: Controller information			
P7.00	Setting of year	2000~2099	2010
P7.01	Setting of month and day	01.01~12.31	01.01
P7.02	Setting of hour and minute	00.00~23.59	12.00
P7.03	Rectifier module temp.	-20.0~100.0℃	Read-only
P7.04	Inverter module temp.	-20.0~100.0℃	Read-only
P7.05	DSP software version	1.00~9.99	Read-only
P7.06	MCU software version	1.00~9.99	Read-only
P7.07	FPGA software version	1.00~9.99	Read-only
P7.08	Software version of car board	1.00~9.99	Read-only
P7.09	Software version of group control board	1.00~9.99	Read-only
P7.10	Display of inverter running time	0~65535h	Read-only
P7.11	Display of rated inverter power	0.4~1200.0kW	Read-only
P7.12	Display of rated inverter current	0.1~2000.0A	Read-only
A1 group: Floor setting			
A1.00	Calling control mode	0: Full collective selective 1: Reserved 2: XPM	0
A1.01	Setting of total floor	2~64	16
A1.02	Setting of ground floor	0~10	0
A1.03	Setting of forced descending floor under fire	0~A1.01	1
A1.04	Setting of appointed parking floor	0~A1.01	1
A1.05	Returning-to-home floor setting	0~A1.01	1
A1.06	Security floor setting	0~A1.01	1
A1.07	Starting time of security floor	0~2359	0
A1.08	End time of security floor	0~2359	0
A1.09	Reserved	0~65535	0
A2 group: Floor display			
A2.00	Displaying content of 1st floor	0~9999	1617
A2.01	Displaying content of 2nd floor	0~9999	1618
A2.02	Displaying content of 3rd floor	0~9999	1619

Function code	Name	Parameter range and instruction	Default value
A2.03	Displaying content of 4th floor	0~9999	1620
A2.04	Displaying content of 5th floor	0~9999	1621
A2.05	Displaying content of 6th floor	0~9999	1622
A2.06	Displaying content of 7th floor	0~9999	1623
A2.07	Displaying content of 8th floor	0~9999	1624
A2.08	Displaying content of 9th floor	0~9999	1625
A2.09	Displaying content of 10th floor	0~9999	1716
…	…	…	…
A2.63	Displaying content of 64th floor	0~9999	2220
H0 group: Logic setting of main board input point			
H0.00	Main board logic setting 1	0~255	255
H0.01	Main board logic setting	0~255	3
H0.02	Main board logic setting 3	0~255	14
H0.03	Main board logic setting 4	0~255	0
H0.04	Reserved	0~255	0
H0.05	Reserved	0~255	0
H1 group: Logic setting of car board input point			
H1.00	Front door logic setting 1	0~255	152
H1.01	Front door logic setting 2	0~255	0
H1.02	Rear door logic setting 1	0~255	0
H1.03	Rear door logic setting 2	0~255	0
H1.04	Reserved	0~255	0
H1.05	Reserved	0~255	0
H2 group: Front door stopping floor			
H2.00	Front door 1~8 floor	0~255	255
H2.01	Front door 9~16 floor	0~255	255
H2.02	Front door 17~24 floor	0~255	255
H2.03	Front door 25~32 floor	0~255	255
H2.04	Front door 33~40 floor	0~255	255
H2.05	Front door 41~48 floor	0~255	255
H2.06	Front door 49~56 floor	0~255	255
H2.07	Front door 57~64 floor	0~255	255
H3 group: Rear door stopping floor			
H3.00	Rear door 1~8 floor	0~255	0
H3.01	Rear door 9~16 floor	0~255	0

Function code	Name	Parameter range and instruction	Default value
H3.02	Rear door 17~24 floor	0~255	0
H3.03	Rear door 25~32 floor	0~255	0
H3.04	Rear door 33~40 floor	0~255	0
H3.05	Rear door 41~48 floor	0~255	0
H3.06	Rear door 49~56 floor	0~255	0
H3.07	Rear door 57~64 floor	0~255	0
H4 group: Front/rear door stopping floor			
H4.00	Front/rear door 1~8 floor	0~255	0
H4.01	Front/rear door 9~16 floor	0~255	0
H4.02	Front/rear door 17~24 floor	0~255	0
H4.03	Front/rear door 25~32 floor	0~255	0
H4.04	Front/rear door 33~40 floor	0~255	0
H4.05	Front/rear door 41~48 floor	0~255	0
H4.06	Front/rear door 49~56 floor	0~255	0
H4.07	Front/rear door 57~64 floor	0~255	0
L0 group: Parallel connection and group control setting			
L0.00	Elevator group number	0~10	0
L0.01	Up bias floor	0~64	0
L0.02	Down bias floor	0~64	0
L0.03	Parallel homing floor	0~64	0
T0 group: Time setting			
T0.00	Door open delay	0~500.0s	3.0
T0.01	Reserved	0~500.0s	45.0
T0.02	Returning-to-home floor delay	0~5000.0s	120.0
T0.03	Idle energy saving delay	0~5000.0s	60.0
T0.04	Brake open delay	0~5.000s	0.200
T0.05	Brake close delay	0~5.000s	0.400
T0.06	Delay of anti-vibration start-up	0~5.000s	1.500
T0.07	Direction cancellation delay	0~5.000s	0.200
T0.08	Inspection stopping delay	0~5.000s	0.300
T0.09	Fire running delay	0~5.000s	0.000
T0.10	Arrival gong delay	0~5.000s	0.000
T0.11	Delay of thermal protection reset	0~5000s	600
T0.12	Delay of advance door-open	0~5.000s	0
T0.13	Delay of creeping leveling	0~5.000s	0

Function code	Name	Parameter range and instruction	Default value
T0.14	Speed reference delay	0~5.000s	0.500
T0.15	Delay of brake voltage switching	0~5.000s	0
T0.16	Retention time of door-open delay	0~500.0s	30.0
T0.17	Running protection time during whole journey	0~100.0s	45.0
T0.18	Protection time of single floor running	0~100.0s	45.0
T0.19	Door open delay at fast stop	0~65535	0
T0.20	Delay time of inspection speed division	0~10s	0
T0.21	Door-close protection time of door operator	0~10s	0
T0.22	Retention time of door-open output	0~65535s	0
T0.23	UPS energy saving delay	0~65535s	0
T0.24	UPS door-close delay	0~65535s	0
…	…	…	…
T0.26	Detection time of blocked door open/close	0~65535s Valid value: 20~64	20
T0.27	Parallel idle time of elevator	0~65535s	0
T0.28	Reserved	0~65535	0
F0 group: Function setting			
F0.00	High/low voltage detection	0: Detect high voltage only 1: Detect low voltage only 2: Detect both high and low voltage	2
F0.01	Hand door enabling	0: Invalid 1: Do not detect door open/close signal Fast running can only be continued once the door opens 3: Cargo elevator (do not detect car board, running at fast speed after door lock is disconnected) 9: Lobby door electric lock hand door	0

Function code	Name	Parameter range and instruction	Default value
F0.02	Door-close output delay	0: Stop door close output after door closes 0.1~600.0s: Time of continuous door close output after door closes If it is set to 600, door close will maintain	0.5
F0.03	Fire mode	0: Domestic fire 1: India fire 2: UK fire 3: Specialized fire for 2012	0
F0.04	Door close output condition of two doors	0: If door lock is blocked, two doors will output door close simultaneously 1:End corresponding door close command after door closes	0
F0.05	Same-floor parallel lobby calling Door open mode	1:Main/vice elevator opens the door simultaneously 2: Main elevator opens the door 3: Vice elevator opens the door	0
F0.06	Reset mode for overtime running	0: Manual reset 1: Returning to leveling automatically	0
F0.07	IND multi-function definition in the car	0: Original definition 1: Door open delay button 2: Front/rear door selection 3: Fire input in the car	1
F0.08	Anti-disturbance internal command limit	0: Invalid 1~5:Light load internal command limit number	0
F0.09	Setting of front/rear door type	0: Dual control cabinet mode (rear door logic needs to be set) 1: Single control cabinet mode	1
F0.10	Fire output	0: Output after forced descending under fire 1: Output in fire homing floor only after forced descending under fire	
F0.11	Internal command door open enabling of current floor	0:Do not open the door at internal command of current floor 0:Open the door at internal command of current floor	0

Function code	Name	Parameter range and instruction	Default value
F0.12	Input point LIN1 Multi-function definition	0~40 0~2: Reserved 3:Medium speed down forced speed-change switch 4:Medium speed up forced speed-change switch 5:High speed down forced speed-change switch 6:High speed up forced speed-change switch 7:Down limit 8: Up limit 9: Reserved 10: Inspection signal 11: Inspection up button signal 12: Inspection down button signal 13: Upper door area (read door open detection) 14: Lower door area 15~16: Reserved 17: Lock elevator signal 18:Contact detection of drive output contactor 19: Contact detection of brake contactor 20: Brake travel switch detection 21: Motor thermal protection 22: Fire action input 23: Reserved 24: Full load signal 25: Overload signal 26~27: Reserved 28: Advance door open feedback 29: Reserved 30: Earthquake 31~32: Reserved 33: Door opens 34: Door closes 35: UPS output detection 36: Dual brake travel detection 37: Star-delta output detection 38: UCM input signal	24

Function code	Name	Parameter range and instruction	Default value
F0.13	Input point LIN2 Multi-functional definition	39: The third brake travel detection 40:Car top protection detection of villa elevator	25
F0.14	Input point LIN3 Multi-functional definition		30
F0.15	Output point in the car Multi-functional definition	0~65535 The ones: Define RDC terminal of DC01 board Or the LED corresponding to PAS of car top command board The tens: Define RDO terminal of DC01 board Or the LED corresponding to DOD of car top command board 0: Door open/close output indicator of rear door 1: Delayed door open button light 2: Mapping PLC edit port OUT1 (Y5) 3: Mapping PLC edit port OUT2 (Y6) 4: Low speed door close signal 5: India direct drive status light	10
F0.16	Test mode selection	0~65535 1: Communication reset at drive fault 4: When beam overtime failed, the door can be closed by close button 8: Does not open the door at fast arrival, block lobby calling 16:Cancel number clearance via double click 32: Does not open the door at brake fault 64:Enable creeping UCM protection function	0

Function code	Name	Parameter range and instruction	Default value
F0.17	Selection related to CAN communication	0~65535 1: Public protocol (The lobby calling CAN communication line of public protocol must be connected to the communication line of car top board) 2: The overload voltage of weighing sensor>full load voltage>light load voltage 4: Clear number at fast stop in door area, otherwise the number will be cleared at deceleration point. 16: When internal calling is public protocol, lobby calling adopts internal protocol and is connected to lobby calling line, otherwise public protocol will be adopted and connected to the same line with internal calling.	0
F0.18	Selection related to elevator running	0~65535 1:Connect lobby calling to internal calling line 2: Cyclic scan of parallel lobby calling 4:Take speed into account when calculating parallel dispatch 8: Communication IC card enabling 16: Enabling non-number clearance at reverse of Internal calling far-end. 32: Enabling door open waiting at homing floor 64: Enabling energy saving at door open waiting in homing floor (in this state, beam action cancels energy saving automatically) 128:Enabling door open waiting at each floor (In this state, the energy saving setting remains valid) 512:Enabling blocking device of villa elevator (SUS3: up blocking switch; SDS3: Down blocking switch SUS2:Up travel limit; SDS2: Down travel limit)	0

Function code	Name	Parameter range and instruction	Default value
F0.19	Drive CD phase monitoring	0~65535 1: The CD phase value of drive monitoring is the max. value of current running 2: The CD phase value of drive monitoring is the min. value of current running 4: The CD phase sampling value of drive monitoring is the bias value of counting	0
F0.20	Stop curve filter coefficient	0~65535 Valid value is 1~255 (Generally, this value needs no setting, however, in cases where vibration occurred after stopping at door area, it is viable to set this value properly)	0
F0.21	Levelling creeping distance	0~65535 Valid value is 10~200mm (In cases where asynchronous motor belt sheave drive or the steel rope of super-high floor slips seriously, it is viable to set the value properly, value modification will become valid after saving and power off)	0
F0.22	UPS application protocol	0~65535 0: 220V power supply (The switching of drive power is controlled by OUT2, it is necessary to set KPWR input point as NC logic and detect UPS output feedback as well as bus voltage, After door opening at returning-to-leveling, cut off OUT2 at a delay) 1: 380V power supply (The switching of drive power is completed by UPS itself, there is no need for bus voltage detection, output OUT2 at a delay after door opening at returning-to-leveling, KPWR input point logic is optional)	0

Function code	Name	Parameter range and instruction	Default value
F0.23	Specific function selection	0~65535 1: Returning leveling display direction 2: Independent running state, blank screen occurred to lobby calling circuit 8: Enabling leveling adjustment within the car 64: Static autotuning of synchronous motor power-up inspection 128: Block rear door under India fire mode 256: Detect door-close in fast running state 512: Detect door-close in inspection state	0
F0.24	Double door selection	0~65535 1: Enabling double door area 2: Double door area replaces slow running limit switch 16: Return terminal door area at abnormal stop during fast running This parameter must be modified under inspection state of ground floor door area 64: Enabling lobby calling VIP function	0
F0.25	Reserved	0~65535	0
F0.26	Starting time 1 of time-sharing service	0~2359 The thousands and hundreds: hour The tens and ones: minute	0
F0.27	Ending time 1 of time-sharing service	0~2359 The thousands and hundreds: hour The tens and ones: minute	0
F0.28	Time-sharing service time 1 Stoppable floor: 1~16	0~65535	0
F0.29	Time-sharing service time 1 Stoppable floor: 17~32	0~65535	0

Function code	Name	Parameter range and instruction	Default value
F0.30	Time-sharing service time 1 Stoppable floor: 33~48	0~65535	0
F0.31	Time-sharing service time 1 Stoppable floor: 49~64	0~65535	0
F0.32	Starting time 2 of time-sharing service	0~2359 The thousands and hundreds: hour The tens and ones: minute	0
F0.33	Ending time 2 of time-sharing service	0~2359 The thousands and hundreds: hour The tens and ones: minute	0
F0.34	Time-sharing service time 2 Stoppable floor: 1~16	0~65535	0
F0.35	Time-sharing service time 2 Stoppable floor: 17~32	0~65535	0
F0.36	Time-sharing service time 2 Stoppable floor: 33~48	0~65535	0
F0.37	Time-sharing service time 2 Stoppable floor: 49~64	0~65535	0
F0.38	Starting time 3 of time-sharing service	0~2359 The thousands and hundreds: hour The tens and ones: minute	0
F0.39	Ending time 3 of time-sharing service	0~2359 The thousands and hundreds: hour The tens and ones: minute	0
F0.40	Time-sharing service time 3 Stoppable floor: 1~16	0~65535	0
F0.41	Time-sharing service time 3 Stoppable floor: 17~32	0~65535	0
F0.42	Time-sharing service time 3 Stoppable floor: 33~48	0~65535	0

Function code	Name	Parameter range and instruction	Default value
F0.43	Time-sharing service time 3 Stoppable floor: 49~64	0~65535	0
F0.50	Reserved	0~65535	0
…	…	…	…
F0.57	Front door 1~16 Floors open to communication-type IC card	0~65535	0
F0.58	Front door 17~32 Floors open to communication-type IC card	0~65535	0
F0.59	Front door 33~48 Floors open to communication-type IC card	0~65535	0
F0.60	Front door 49~64 Floors open to communication-type IC card	0~65535	0
F0.61	Rear door 1~16 Floors open to communication-type IC card	0~65535	0
F0.62	Rear door 17~32 Floors open to communication-type IC card	0~65535	0
F0.63	Rear door 33~48 Floors open to communication-type IC card	0~65535	0
F0.64	Rear door 49~64 Floors open to communication-type IC card	0~65535	0
F0.65	Reserved	0~65535	0
…	…	…	…

Function code	Name	Parameter range and instruction	Default value
F0.69	Independent detection on lobby/door lock	0~65535 1: Adopt EC-UCM board (select EC-RDB board when the default value is 0) 2: Enabling independent inspection on lobby/door lock	0
F0.70	Definition of front door door open/close relay	0~65535 0: Original definition 1: Output control contactor control 1 2: Star-delta output 3: Brake contactor control 1 4: Brake contactor control 2 5: Fire return 6: Front door open output 7: Front door close output 8: Rear door open output 9: Rear door close output 10: Advance door open output 11: Low speed signal 12: UPS control 13: Lock elevator and return 14: Energy-saving output 15: Forced door close output 16: Elevator up signal 17: Elevator down signal 18: Important fault signal 19: Creeping UCM protection 20:Security floor time frame output 21: UCM inspection request 25: Down arrival gong 26: Up arrival gong 27: Fire open delay alarm 28:Fire decreasing close output 29: Lobby door electric lock output 31~94: Corresponding to 1~64 floor door area output	0
F0.71			0

Function code	Name	Parameter range and instruction	Default value
…	…	…	…
F0.75	The set voltage of analog light load	0~65535	0
F0.76	The set voltage of analog full load	0~65535	0
F0.77	The set voltage of analog overload	0~65535	0
…	…	…	…
F0.80	Slip test selection for safety gear	0~65535 0: No operation 1: Safety gear slip test	0
F0.81	Door operator type enabling	0~65535	0
F0.82	Time block of arrival gong	0~2323 The thousands and hundreds stand for the time when arrival gong starts muting The tens and ones stand for the time when arrival gong stops muting	0
F0.83	Enabling lobby calling parameter setting	0~65535 0: No operation 1: Main board sets lobby calling parameter 2: Main board enables NO.10 fault 12345: Set lobby calling address	0
F0.84	Lobby calling function parameter 1	0~65535 1: Inspection state, dot matrix lobby calling flickers inspection and floor number 2: Buzzer enabling 4:Fire state, blank screen occurred to lobby calling 8:Inspection symbol for dot matrix lobby calling is JX 16:The direction of dot matrix lobby calling is represented in thin arrow 64: Rear door enabling	0

Function code	Name	Parameter range and instruction	Default value
F0.85	Lobby calling function parameter 2	0~65535 1: No energy-saving for LCD lobby calling 2: During running, LCD lobby calling arrow flashes 4:LCD lobby calling displays Chinese and English simultaneously 8:The arrow rolls when specific LCD lobby calling is running. 16:Fire state, lobby calling displays XF 32: External calling adhesion enabling 256: Group control selection 512: Forecasting light selection	0
F0.86	Specific lobby calling T1/T2 selection	0~65535 High bit T2, low bit T1 1: Up forecasting light 2:Down forecasting light 3: Arrival gong 4: Over-full load 5: Fire 6: Lock elevator 7: Inspection 8: Fault 9: Pause 10: Up orientation 1: Down orientation 12: In running	0
F0.87	DS multi-function definition in the car	0~65535 0: Original definition 1: Door open retention delay button 2: Front/rear door selection 3: Car fire fighter input	0
…	…	…	…
F0.90	Starting speed	0~65535mm/s	0
F0.91	Retention time of starting speed	0~65535ms	0

Function code	Name	Parameter range and instruction	Default value
F0.92	Brake force self-detection enabling	0~65535	0
F0.93	Brake force self-detection cycle	0~65535	15
F0.94	Brake force self-detection state	0~65535	0
F0.95	Slip distance	0~65535mm	1
F0.96	Balance coefficient	0~65535	450
…	…	…	…
F0.99	Reserved	0~65535	0
U0 group: Calling command			
U0.00	Manual calling	0~64: Designating physical floor calling 0 or invalid floor: No operation	0
U0.01	Random running	0~65535 random running The running times is ten times of the setting value	0
U1 group: System monitoring			
U1.00	Low bit of running times	0~65535	Read-only
U1.01	High bit of running times	0~65535	Read-only
U1.02	Low bit of accumulative running time	0~65535min	Read-only
U1.03	High bit of accumulative running time	0~65535min	Read-only
U1.04	Current elevator reference speed	0~9999mm/s	Read-only
U1.05	Reference frequency monitoring	0.00~400.00Hz	Read-only
U1.06	Magnetic pole position angle	0.00~360.00	Read-only
U1.07	Static autotuning detection current	0.0~300.0%	Read-only
U1.08	C phase sampling value	0~1024	Read-only
U1.09	D phase sampling value	0~1024	Read-only
U1.10	Current elevator height	0.00~600.00m	Read-only

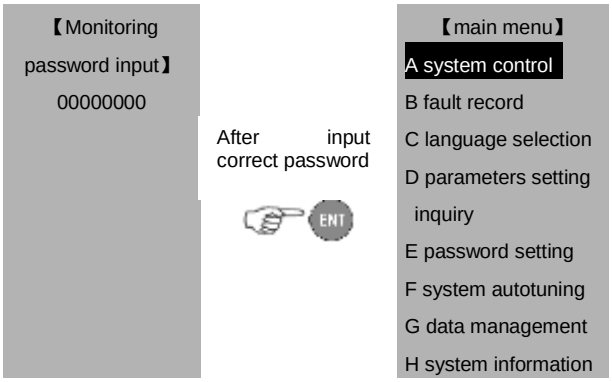
Function code	Name	Parameter range and instruction	Default value
U1.11	Current elevator floor	1~64	Read-only
U1.12	Leveling distance	0.000~0.500m	Read-only
U1.13	Low bit of input terminal state	0~65535	Read-only
U1.14	High bit of input terminal state	0~65535	Read-only
U1.15	Extension input terminal state	0~65535	Read-only
U1.16	Number clearance reminder	0~65535	Read-only
U1.17	Input terminal state in the car	0~65535	Read-only
U1.18	Output terminal state of main board	0~65535	Read-only
U1.19	Current elevator feedback speed	0~65535	Read-only
U1.20	Elevator running state	0~65535	Read-only
U1.21	Output current	0.0~1000.0A	Read-only
U1.22	Output voltage	0~1000V	Read-only
U1.23	Output frequency	0.00~999.99Hz	Read-only
U1.24	Output rotating speed	0~10000rpm	Read-only
U1.25	Output power	0.0~200.0kW	Read-only
U1.26	Bus voltage	0.0~1000.0V	Read-only
U1.27	Torque command	-250.0~250.0%	Read-only
U1.28	Torque compensation	-250.0~250.0%	Read-only
U1.29	Current load	0~10000kG	Read-only
U1.30	Calculated deceleration distance	0~60.000m	Read-only
U1.31	Calculated stopping distance	0~60.000m	Read-only
U1.32	Analog input voltage	0~10.0V	Read-only
U1.33	Extension output terminal state	0~65535	Read-only

Function code	Name	Parameter range and instruction	Default value
U1.34	Output terminal state in the car	0~65535	Read-only
U1.35	Elevator state	0~65535	Read-only
U2 group: Hoistway information			
U2.00	Total floor height	0~600.00m	Read-only
U2.01	Low speed down forced deceleration distance	0~60.000m	Read-only
U2.02	Low speed up forced deceleration distance	0~60.000m	Read-only
U2.03	Medium speed down forced deceleration distance	0~60.000m	Read-only
U2.04	Medium speed up forced deceleration distance	0~60.000m	Read-only
U2.05	High speed down forced deceleration distance	0~60.000m	Read-only
U2.06	High speed up forced deceleration distance	0~60.000m	Read-only
U2.07	The longest floor distance	0~60.000m	Read-only
U2.08	The shortest floor distance	0~60.000m	Read-only
U2.09	Reserved	0~65535	Read-only
E0 group: Fault record			
E0.00	Total fault number	0~30	AL. 30
E0.01	Fault record serial number	1~30, 1 is the latest fault	No. 01
E0.02	Fault code	1~139	Er.139
E0.03	Fault occurring year	2000~2099	n2013
E0.04	Fault occurring month/day	0~1231	10.101
E0.05	Fault occurring hour and minute	0~2359	F.1200
E0.06	Fault occurring second	0~59	SEC.00
E0.07	Fault occurring floor	0~64	FL 16

Function code	Name	Parameter range and instruction	Default value
E0.08	Low 16 bit input terminal state	1.0000~1.FFFF	1FFFF
E0.09	High 16 bit input terminal state	2.0000~2.FFFF	2FFFF
E0.10	Output terminal state	2.0000~2.2FFF	32FFF
E0.11	Elevator speed when fault occurred	0~9999mm/s	3800
E0.12	Elevator position when fault occurred	0~999.99m	128.00
E0.13	Bus voltage when fault occurred	0.0~9999.9V	0580.0
E0.14	Output current when fault occurred	0.0~9999.9A	0080.0
E0.15	Running frequency when fault occurred	0.00~999.99Hz	028.00
E0.16	Back-up	0~65535	00000
E0.17	Back-up	0~65535	00000
E0.18	Back-up	0~65535	00000
E0.19	Back-up	0~65535	00000

Chapter 6 Function parameters

6.1 Original debugging interface



The monitoring password can only enter A, B, E and H parameters of the main menu and entering E menu can only modify monitoring interface password.

If it is necessary to switch authorization, re-power on and press ESC key in password input interface to switch into debugging or factory mode.

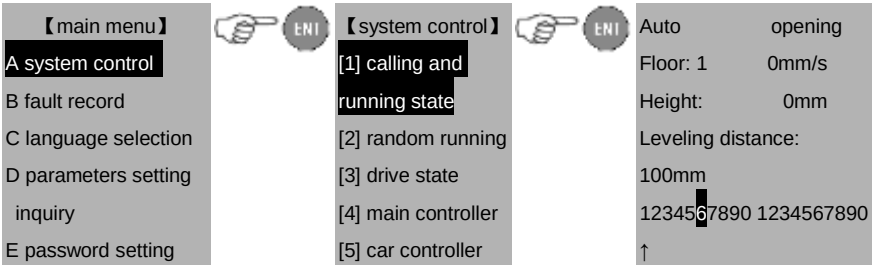
The original value of monitoring password and debugging password is 00000000.

6.2 System monitoring

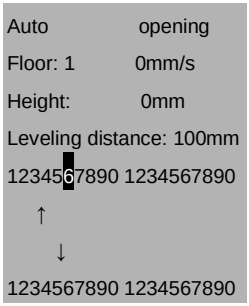
6.2.1System monitoring --- calling and running state

6.2.1.1 Calling state

After entering 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.



6.2.1.2 Monitoring system—Calling and running state



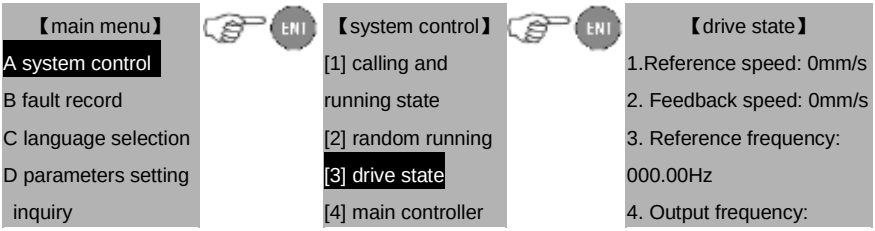
This interface will display the state of the elevator such as auto, maintenance, fire safety, attendant, lock, fault, overload and full load, the current floor and height, the leveling distance of the last fast arrival at door area and the state of door operator (including door open output and switch signal).

How to make calling via operator: Move the cursor onto the target floor number, press ENT to register calling commands in the car, press DOWN button to register down calling command, similarly, press UP button to register the up calling command.

6.2.2 System monitoring ---random running

After entering this interface, the elevator enters the random running state automatically.

6.2.3 System monitoring ---driving state



E password setting F system autotuning G data management H system information	[5] car controller	000.00 Hz 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 System monitoring ---main 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		【system control】 [1] calling and running state [2] random running [3] drive state [4] main controller [5] car controller		【input signal 1－32】 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 【output relay 1－12】 1 2 3 4 5 6 7 8 9 10 11 12 【use the UP/DOWN key to turn pages and inquire the state and function】

It is used to view the state of output/input point of I/O board, inquire the definition of each input/output point by UP/DOWN key as shown below:

【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		10 inspection signal 11 inspection up signal 12 inspection down signal 13 upper door area 14 lower 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		20 brake travel switch 21 motor thermal protection 22 fire action input 23 UPS input signal 24 high voltage detection on safety circuit 25 high voltage detection on car door lock 26 high voltage detection on lobby door lock 27 hardware enabling

9 emergency-motion	brake contactor	28 advance door open feedback 29 advance door open adhesion

6.2.5 System monitoring ---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		【system control】 [1] calling and running state [2] random running [3] drive state [4] main controller [5] car controller
		【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 pages and inquire the state and function】

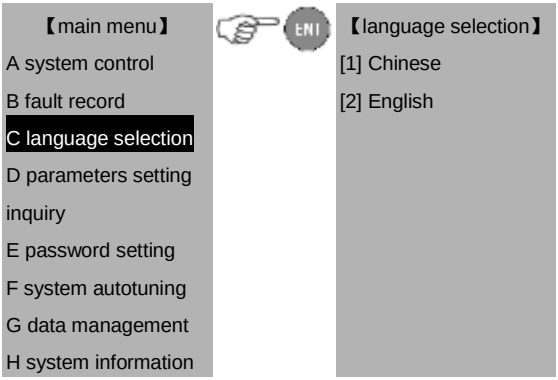
The state change of each point can be viewed when input/output point of car main controller DC-01 board changes, inquire the definition of each input/output point by UP/DOWN key.

6.3 Fault history record

【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		【fault record】 Fault 1 of 3 Fault code: 30 Floor: 1 2010-12-10 23：24：12 Fault instruction: 30# safety circuit fault 【press ENT to view fault state】
		System state when fault occurred. Input state 1:0000 Input state 2:000E Input state：000 Elevator speed: 0m/s Car position: 70mm Bus voltage: 0557.8 Current when fault occurred: 0000.0A Running frequency: 000.0HZ 【press ENT to return】

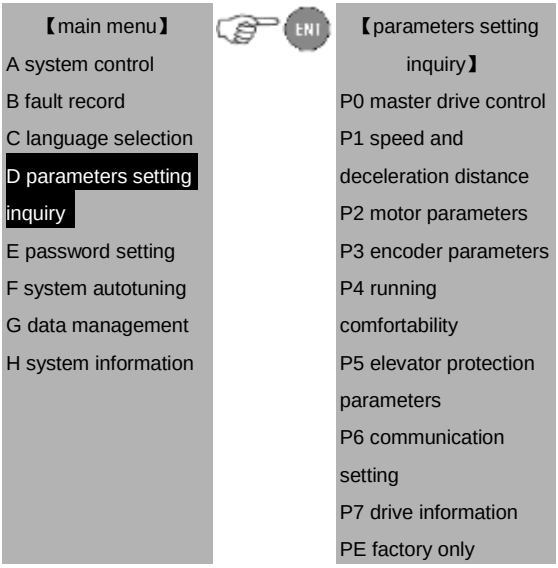
The fault history record: the first one stands for the latest fault and the floor stands for the elevator floor where the fault occurs. Detailed fault time and instructions can be obtained by pressing ENT.

6.4 Language selection

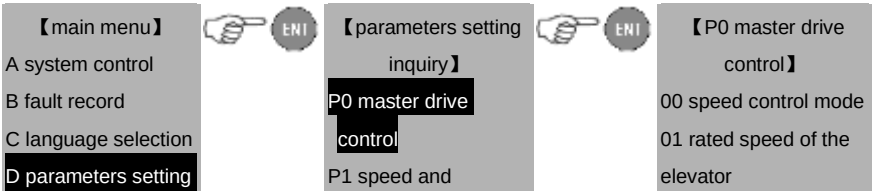


6.5 Parameters setting inquiry

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



6.5.1 Parameters setting –master drive control



inquiry E password setting F system autotuning G data management H system information	deceleration distance P2 motor parameters P3 encoder parameter P4 running comfortability P5 elevator protection parameters P6 communication setting P7 drive information PE factory only	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

Function code	Instruction	Setting range【default value】	Remarks
P0_00	Speed control mode	0-2【1】	Non-modifiable during running
Select the speed control mode of the system. 0: VC without PG, namely open-loop vector, only suitable for the debugging mode of asynchronous master; 1: VC with PG, namely close-loop vector, it is necessary to install encoder; 2: V/F control, , only suitable for the debugging mode of asynchronous master			

Function code	Instruction	Setting range【default value】	Remarks
P0_01	Rated speed of the elevator	0.100~6.000m/s【1.750】	Non-modifiable in running
Input this parameter according to the elevator nameplate. This is the reference value for the actual running speed of 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】	Non-modifiable 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】	Non-modifiable 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】	Non-modifiable in running

The advantages of high carrier frequency: optimal current waveform, low current harmonics, low motor noise;

Disadvantages of high carrier frequency: increased switch loss, increased drive temperature rise, impacted drive output capacity, derated operation of the drive, increased leakage current of the drive as well as increased electromagnetic interference to the outside.

If low carrier frequency is used, the situation will be contrary to the above-mentioned. 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】	Non-modifiable 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, modify this parameter

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 ACC/DEC	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		06 Door area
H system		07 Zero-speed threshold
		08 Low speed threshold of advance door open
		09 Inspection speed
		10 Peristaltic leveling speed

information	P6 communication setting P7 drive information PE factory only	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)	0.001~9.999m/s^3【0.350】	Non-modifiable in running
P1_01	Increasing acceleration 2 (fast acceleration at the ending stage)	0.001~9.999m/s^3【0.350】	
P1_02	Acceleration speed	0.001~9.999m/s^2【0.700】	
P1_03	Reducing deceleration 1 (fast deceleration at the beginning stage)	0.001~9.999m/s^3【0.350】	
P1_04	Reducing deceleration 2 (fast deceleration at the ending stage)	0.001~9.999m/s^3【0.350】	
P1_05	Deceleration speed	0.001~9.999m/s^2【0.700】	

◆ The set acceleration or deceleration should not exceed 3 times of the corresponding value of increasing acceleration or decreasing deceleration.

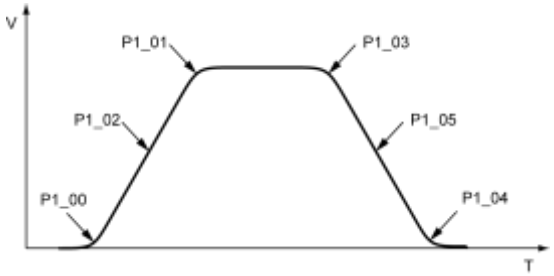


Figure 6-1 Parameters diagram of S curve

Function code	Instruction	Setting range 【default value】	Remarks
P1_06	Door area	100~999【200】	Non-modifiable in running

	◆ 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 based on actual condition. Modify this parameter to adjust landing precision before fast debugging landing. ◆ After hoistway autotuning or saving, the value is limited to 400 automatically.

Function code	Instruction	Setting range【default value】	Remarks
P1_07	Zero-speed threshold	0~0.050m/s【0】	Non-modifiable in running
Zero-speed threshold means the min. running speed before closing at stop.			

Function code	Instruction	Setting range【default value】	Remarks
P1_08	The speed threshold of advance door opening	0~0.500m/s【0.050】	Non-modifiable in running
The speed threshold of advance door opening is the max. allowed running speed before advance door opening.			

Function code	Instruction	Setting range【default value】	Remarks
P1_09	Inspection speed	0~0.630m/s【0.200】	Non-modifiable in running
P1_10	Creeping 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】	
When the elevator overshoots during landing at fast stop (stops running after crossing the landing line), then for landing precision, add the additional distance the elevator needs to run based on original value, if the elevator undershoots (stops running before reaching the landing line), then decrease the distance not travelled by the elevator based on original value.			

	◆ When P1_14 is set to 50, the up/down landing adjustment of PB or PD group is valid.

Function code	Instruction	Setting range【default value】	Remarks

P1_15	Decreasing deceleration of creeping	0~10.000m/s^3【0.200】	Non-modifiable in running
After enabling climbing at fast running, the stopping will decrease deceleration.			
Function code	**Instruction**	**Setting range 【default value】**	**Remarks**
P1_16	High speed current loop proportional coefficient	0~65535【0】	Non-modifiable in running
P1_17	High speed current loop integral coefficient	0~65535【0】	Non-modifiable in running
Normally, this parameter needs no adjustment, however, when the high/low speed of the master has different characteristics during load change, it is viable to use current loop switching function (set to 0 to disable this function), the switching mode is the same with speed switching (See details at P4_08 and P4_09)			

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 ACC/DEC
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 motor stator
07 Resistance of motor rotor
08 Inductance of the stator and rotor
09 Mutual inductance of the stator and rotor
10 No-load motor current

◆ 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】	Non-modifiable in running
Select the motor type 0: Asynchronous master 1: Synchronous master			

◆ 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 automatically according to the rated motor power.

Function code	Instruction	Setting range 【default value】	Remarks
P2_01	Rated power of the motor	0.1~150.0kW【7.5】	Non-modifiable 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 during master autotuning. After modifying the rated power of the asynchronous motor, P2_06~P2_10 will match automatically according to the rated power of the motor.			

Function code	Instruction	Setting range 【default value】	Remarks
P2_06	Resistance of motor stator	0~65.535Ω【1.41】	Non-modifiable in running
P2_07	Resistance of motor rotor	0~65.535Ω【1.41】	
P2_08	Inductance of motor stator and rotor	0~6553.5mH【141】	
P2_09	Mutual inductance of motor stator and rotor	0~6553.5mH【140】	
P2_10	No-load motor current	0~655.35A【1.5】	
Above parameters will update automatically after autotuning of the master. These parameters are the reference ones of high performance vector control and have direct impact on the control performance.			

	◆ Do not modify above parameters at will, wrong parameters may cause motor damage.

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 ACC/DEC	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 bias of C phase
	PE factory only	08 Magnetic pole bias of D phase
		09 Initial position of the magnetic pole
		10 Static identification current
		11 Pulse counting direction

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

Function code	Instruction	Setting range 【default value】	Remarks
P3_00	Encoder type selection	0-2【1】	Non-modifiable 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 1 and apply drive 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】	Non-modifiable in running
Set the pulse number of each rotation of the encoder. Incorrect parameter will make the master work improperly.			

Function code	Instruction	Setting range 【default value】	Remarks
P3_02	Encoder direction	0-1【0】	Non-modifiable in running
In motor vector control mode, this parameter must be set correctly, otherwise, malfunction will occur.			

- After changing electrical angle of the master, if the magnetic pole position learned from synchronous master static autotuning is in consistent, change this parameter properly;
- During synchronous rotational autotuning, the tractor swings back and forth and the autotuning fails as a result, change this parameter properly;
- When the first inspection running of asynchronous motor starts, it vibrates violently along with speed deviation or overcurrent fault, change this parameter properly.

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】	Non-modifiable 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. Set to 0 can cancel the fault protection. Ensure the brake fully opens when reporting the encoder disconnection fault and check if 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】	Non-modifiable

P3_07	Magnetic pole position of C phase	0~9999【395】	in running
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 unplugging the encoder. Write the sampling 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 precision of static master autotuning.

Function code	Instruction	Setting range【default value】	Remarks
P3_09	Initial position of the magnetic pole	0.00~360.00【0.00】	Non-modifiable in running

This parameter will update automatically after autotuning completes. It is the most important parameter of master running and cannot be modified at will.

Function code	Instruction	Setting range【default value】	Remarks
P3_10	Static identification current	10.0-200.0%【50】	Non-modifiable in running

The reference value of static autotuning. This parameter is used to set the percentage of the master static autotuning identification current relative to the rated master current. According to the master, it can be set to 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	Non-modifiable in running

When the elevator goes up, if the height of the floor is decreasing, please change the value of P3_11.

◆ Please determine the high speed counting direction before hoistway autotuning by monitoring current elevator height which should be increase during going upward, if not, change this parameter.

Function code	Instruction	Setting range【default value】	Remarks

P3_12	Sin/cos encoder line position	0~65535【0】	Non-modifiable in running
Selection of 1387 encoder CD line position 0: Corresponding detection of CD positive/negative signal 1: Cross detection of CD positive/negative signal			

6.5.5 Parameters setting –running comfortability

【main menu】	【parameters setting inquiry】	【P4 running comfortability】
A system control	P0 master drive control	00 ASR low speed proportion gain
B fault record	P1 speed and ACC/DEC	01 ASR low speed integral time
C language selection	P2 motor parameters	02 Speed detection low speed filter 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 filter times
H system information	P7 drive information	07 Switch high point frequency
	PE factory only	08 Current loop proportional coefficient P
		09 Current loop integral coefficient I
		10 Current loop filter coefficient
		11 Slip compensation of drive side
		12 Slip compensation of braking side
		13 Torque upper limit
		14 Load compensation enabling
		15 Load compensation time
		16 Reducing time of load compensation
		17 Load compensation ASR proportional gain
		18 Load compensation ASR integral time
		19 Position loop APR proportional gain
		20 Position loop 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 gain at the braking side
27 Bias gain at the drive side
28 Weighing filter of the car
29 Weighing filter of engine room
30 Smooth filter time of the curve

Function code	Instruction	Setting range 【default value】	Remarks
P4_00	ASR low speed proportional gain	0~100【20】	Non-modifiable in running
P4_01	ASR low speed integral time	0.01~10.00s【0.50】	
P4_02	Speed detection low speed filter times	0~8【0】	
P4_03	Switch low point frequency	0.00Hz~10.00Hz【2.00】	
P4_04	ASR high speed proportional gain	0~100【20】	
P4_05	ASR high speed integral time	0.01~10.00s【0.60】	
P4_06	Speed detection high speed filter 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 above the high point switch frequency (P4_07), speed loop parameter PI is P4_04 and P4_05. Between them, the PI parameter is gained by the linear changes of the two groups of parameter.

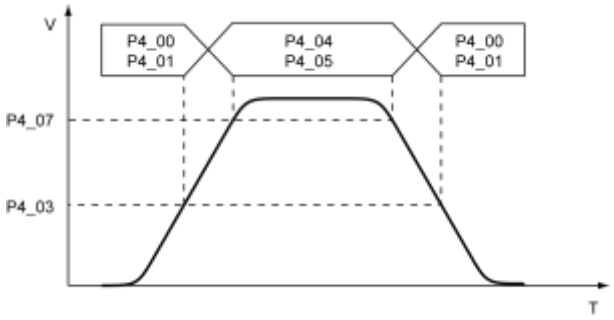


Figure 6-2 Parameters of speed loop PI

- ◆ Increase speed loop proportional gain or decrease integral time can accelerate dynamic response of speed loop;
- ◆ Too large speed loop proportional gain or too small integral time will cause overshoot which incurs system oscillation;
- ◆ On the contrary, too small speed loop proportional gain may easily cause poor system following performance which will impose a negative impact on stopping;
- ◆ P4_02 and P4_06 are filter times of speed detection which need no adjustment under normal conditions, however, if current noise occur during motor running, then set the parameter properly.

Function code	Instruction	Setting range 【default value】	Remarks
P4_08	Currnet loop proportional gain P	0~65535【2000】	Non-modifiable in running
P4_09	Currnet loop integral gain I	0~65535【1000】	

Note: The above parameters are PI adjustment parameters for current loop, which directly affects the dynamic response speed and control accuracy of the system. These parameters may need to be adjusted properly depending on different situations.

- ◆ Incorrect parameters will cause vibration to the system.

Function code	Instruction	Setting range 【default value】	Remarks
P4_10	Current loop filter coefficient	0-65535【3】	Non-modifiable in running

Bit0~bit2 correspond to running torque command filter times and the max. value is 7 (default value 3 means filter time=2^3/carrier frequency) Bit3~bit5 correspond to starting torque command filter times and the max. value is 7(default value is 0). When starting the noise, it is viable to set this value.

	◆ This parameter is combination setting, when it is needed to set the running torque filter to 2 times and starting torque filter to 3 times, the parameter setting value =2+3*8=26

Function code	Instruction	Setting range【default value】	Remarks
P4_11	Slip compensation of drive side	50~200%【100】	Non-modifiable in running
P4_12	Slip compensation of braking side	50~200%【100】	
Slip compensation coefficient is used to adjust slip frequency of vector control, when output voltage exceeds rated voltage when asynchronous master runs at full speed and causes loud master noise or vibration, it is viable to increase corresponding slip compensation properly.			

Function code	Instruction	Setting range【default value】	Remarks
P4_13	Torque upper limit	0.0~200.0% (rated current)【150.0】	Non-modifiable in running
100.0% corresponds with the rated current of integrated machine. When carrying out model load test, it may be necessary to increase this parameter properly.			

Function code	Instruction	Setting range【default value】	Remarks
P4_14	Load compensation enabling	0~1【1】	Non-modifiable 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	Load compensation ASR proportional gain	0~100【30】	
P4_18	Load compensation ASR integral time	0.01~10.00s【0.16】	
P4_19	Position loop APR proportional gain	0~100【0】	
P4_20	Position loop 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-weighing compensation starting function.

P4_14, when it is set to 1, it means enabling this function, set to 0 means disabling this function;

P14_15 means the time starting from adding current to switching off and preparing to give speed;

P14_16 means transition time between zero speed loop to low speed loop;

P4_17 and P4_18 means zero speed loop PI parameter;

P4_19 and P4_20 needs no adjustment under normal conditions;

P4_21 can be modified properly to suppress master oscillation caused by too large starting compensation

Only when P4_14 is set to 1 and enable the non-weighing 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】	Non-modifiable in running
P4_23	Weighing input selection	0~2【0】	

P4_23: Weighing input selection

Set the signal input of LL, FL and OL.

0: Select digital input, Light load, full load and overload signal correspond to LL, FL and OL input points of car board(FL and OL can be defined to LINE1~LINE3 of I/O board via multi-functional input).

1: Select analog input of the car top board. It is necessary to install analog weighing sensor of DC0~10V output and conduct weighing autotuning before setting this selection.

2: Select the analog input of the engine room. It is necessary to install analog weighing sensor of DC0~10V output and conduct weighing autotuning before setting this selection.

- ◆ When the LL voltage<FL voltage<OL voltage for the selected weighing sensor, it is necessary to modify Bit1 of F0_17 to 1(+2 on the original parameter);
- ◆ After setting P4.23 to non-zero value and correctly setting F0_75, F0_76 and F0_77, there is no need to conduct loading autotuning, the loading state will be gained by setting voltage value.

Function code	Instruction	Setting range 【default value】	Remarks
P4_24	Weighing compensation input channel	0-2【0】	Non-modifiable in running
P4_25	Pre-torque bias	0.0~100.0%【45】	

Function code	Instruction	Setting range 【default value】	Remarks
P4_26	Bias gain at the drive side	0.000~5.000【2.000】	
P4_27	Bias gain at the braking side	0.000~5.000【2.000】	

Above parameters are used to set the weighing compensation function during elevator starting.

P4_24 is for setting analog weighing compensation input channel.

0: no compensation

1: CAN communication compensation. It is necessary to install analog weighing sensor with DC0~10V output at the car bottom. The load signal will be sent to the main board via CAN communication in the car.

2: terminal input compensation. It is necessary to install analog weighing signal of DC0~10V output in the engine room.

P4_25 needs to be set to the voltage value of weighing sensor when the elevator is in balanced load, for instance, when the elevator is in balanced load, if the “analog input voltage” in drive monitor is 4V, then this value needs to be set to 40.0%;

When the drive is in the electric motion state (LL down or FL up), adjust P4_26. Increase its value when compensation is not enough and vice versa;

When the drive is in the power generation state (LL up or FL down), adjust P4_27. Increase its value when compensation is not enough and vice versa.

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

Function code	Instruction	Setting range 【default value】	Remarks
P4_28	Analog input filter of car weighing	0.00~0.50s【0.1】	Non-modifiable 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】
A system control
B fault record
C language selection
D parameters

ENT

【parameters setting inquiry】
P0 master drive control
P1 speed and ACC/DEC

ENT

【P5 Elevator protection parameters】
00 Input phase loss protection enabling
01 Output phase loss protection enabling
02 Motor overload protection selection

setting inquiry	P2 motor	03 Motor overload protection current
E password	parameters	04 Overload pre-warning threshold
setting	P3 encoder	05 Overload pre-warning selection
F system	parameters	06 Overload pre-warning delay time
autotuning	P4 running	07 Automatic fault reset times
G data	comfortability	08 Fault reset interval time
management	P5 elevator	09 Speed deviation protection value
H system	protection	10 Speed deviation allowed time
information	parameters	11 Braking threshold voltage
	P6 communication	
	setting	
	P7 drive	
	information	
	PE factory only	

Function code	Instruction	Setting range 【default value】	Remarks
P5_00	Input phase loss protection	0-2【0】	Non-modifiable in running
P5_01	Output phase loss protection	0-1【1】	

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

0: Prohibit

1: Enabling

2: Protect only in running

Function code	Instruction	Setting range 【default value】	Remarks
P5_02	Motor overload protection	0-2【2】	Non-modifiable in running

0: No protection, there is no motor overload protection function (used with caution).

1: Normal motor. For normal motor (with low speed compensation), the lower the speed, the poorer the cooling effect. Based on this reason, if output frequency is lower than 30Hz, the motor overload protection threshold will be decreased to prevent normal motor from overheat.

2: Variable frequency motor. For variable frequency motor (without 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 motor current)【100.0】	Non-modifiable in running
Motor overload protection current = (max. allowed load current / rated current of the integraed machine) * 100%			

◆ 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】	Non-modifiable 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 current threshold of overload prewarning action, 100% corresponds to the rated current of the integrated machine.

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

0: corresponds to the rated motor current, detecting all the time

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

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

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

When output current is larger than overload 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】	Non-modifiable in running
P5_08	Fault reset interval time	0.1~100.0s【10.0】	

When P5_07 is set to non-zero, the drive fault is allowed to reset automatically after passing the interval time set by P5_08, when the reset times exceeds the set value of P5_07, the system will stop and reset can be available after powering off.

Function code	Instruction	Setting range【default value】	Remarks
P5_09	Protection value of overspeed deviation	0.1%~50.0%【20.0】	Non-modifiable in running
P5_10	Detection time of overspeed deviation	0.000~10.000s【0.500】	

	The speed detection is based on the set elevator speed, rated motor frequency can encoder feedback.

Function code	Instruction	Setting range【default value】	Remarks
P5_11	Braking threshold voltage	320~750V【700】	Non-modifiable in running
For 220V integrated machine, it should be modified to 380V.			

Function code	Instruction	Setting range【default value】	Remarks
P5_12	Ramp current cancellation delay	0~65535ms【0】	Non-modifiable in running
After stopping and switching off, if noise occurred to synchronous master, increase this value properly			

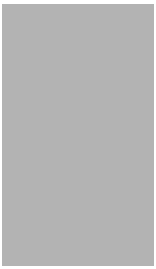
Function code	Instruction	Setting range【default value】	Remarks
P5_13	High speed elevator enabling	0~65535【0】	Non-modifiable in running
When using LIMAX33 SAFE high speed elevator system, this value needs to be set to 1.			

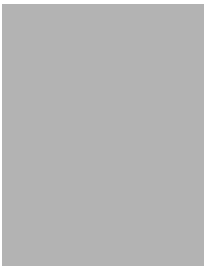
6.5.7 Parameters setting – communication setting

【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 master drive control
P1 speed and ACC/DEC
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only

【P6 Communication setting】
00 Local communication address
01 Communication baud rate selection
02 Data bit check setting
03 Communication response enabling
04 Communication response delay
05 Communication timeout fault
06 reserved
07 reserved
08 Communication speed setting of Ethernet
09 IP address 1





10 IP address 2
11 IP address 3
12 IP address 4
13 Subnet mask 1
14 Subnet mask 2
15 Subnet mask 3
16 Subnet mask 4

Function code	Instruction	Setting range【default value】	Remarks
P6_00	Local communication address	1-247【1】	Non-modifiable in running

Function code	Instruction	Setting range【default value】	Remarks
P6_01	Communication baud rate setting	0-5【4】	Non-modifiable 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

The set baud rate of the upper computer must be the same as that of the machine. The higher the baud rate, the faster the communication speed.

Function code	Instruction	Setting range【default value】	Remarks
P6_02	Data bit check setting	0-2【1】	Non-modifiable in running

The set data format 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】	Non-modifiable in running
0: enabled 1: disabled			

Function code	Instruction	Setting range【default value】	Remarks
P6_04	Communication response delay	0-20ms【0】	Non-modifiable in running
It refers to the interval time from the ending of data receiving by the machine to the beginning of data sending to the upper computer. If the response delay is less than system handling time, the response delay shall subject to system handling time, if it is longer than system handling time, then after data processing by the system, it should wait until response delay time is up before sending data to upper computer.			

Function code	Instruction	Setting range【default value】	Remarks
P6_05	Communication timeout fault	0-100.0s【0】	Non-modifiable in running
If the functional code is set to 0.0, the communication delay time parameter is disabled. When the function code is set to non-zero value, if the interval time between the current communication and the next communication exceeds the communication delay time, the system will report “485 communication fault” error (Err18), NO.118 fault. Normally, it is set to “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】	Non-modifiable 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】	Non-modifiable 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】	Non-modifiable 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

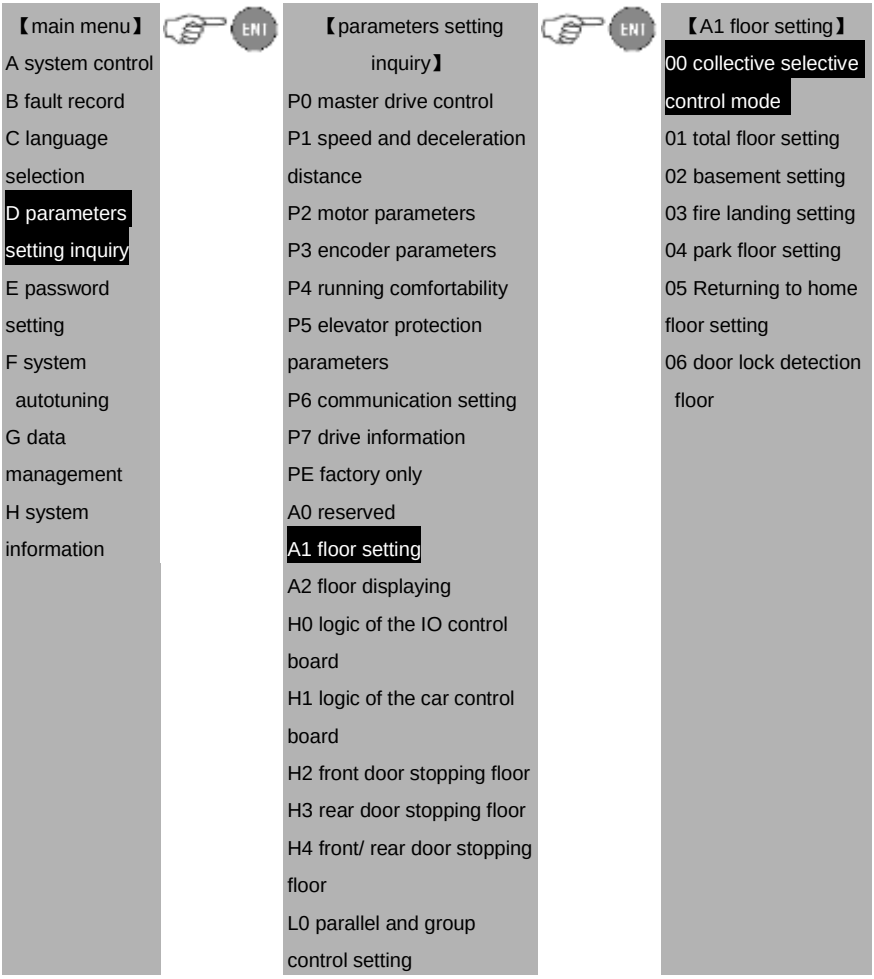
【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

【parameters setting inquiry】
P0 master drive control
P1 speed and ACC/DEC
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only

【P7 Drive information】
00 year setting
01 month/date setting
02 hour/minute setting
03 Rectifier module temperature
04 Inverter module temperature
05 Elevator DSP software version
06 Elevator MCU software version
07 FPGA software version
08 software version of the car board
09 software version of the group control board

		10 running time display 11 rated power display 12 rated current display

6.5.9 Parameters setting—floor setting



Function code	Instruction	Setting range 【default value】	Remarks
A1_00	Collective selective control mode	0-2【0】	Non-modifiable 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 cargo elevator);

Function code	Instruction	Setting range 【default value】	Remarks
A1_01	Total floor setting	2~64【16】	Non-modifiable 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	Home floor setting	1~64【1】	

A1_01 total floors must the the same with installed door area numbers;

A1_02 ground floor, if it involves parallel applications, set the elevator with underground floor as the main elevator;

A1_03 is the destination during fire descending;

A1_04 is the destination after elevator lock becomes valid;

A1_05 is the destination when the no-running request of elevator reaches the returning-tohome floor delay time.

Function code	Instruction	Setting range 【default value】	Remarks
A1_06	Security floor setting	1~A1_01【0】	Non-modifiable in running
A1_07	Starting time of security floor	0~2359【0】	
A1_08	Ending time of security floor	0~2359【0】	

After enabling security floor function, the elevator stops and opens/closes the door automatically when passing by security floor in the set time period.

6.5.10 Parameters setting—floor displaying setting

【main menu】		【parameters setting inquiry】		【A2 Floor displaying】
A system control		P0 master drive control		1st floor displaying
B fault record		P1 speed and deceleration distance		2nd floor displaying
C language selection		P2 motor parameters		3rd floor displaying
D parameters		P3 encoder parameters		4th floor displaying

setting inquiry	P4 running comfortability	5th floor displaying
E password setting	P5 elevator protection parameters	6th floor displaying
F system autotuning	P6 communication setting	7th floor displaying
G data management	P7 drive information	8th floor displaying
H system information	PE factory only	9th floor displaying
	A0 reserved	.
	A1 floor setting	.
	A2 floor displaying	.
	H0 logic of the IO control board	64th floor displaying
	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
A2_00	1st floor displaying	0~9090【1617】	Non-modifiable in running
A2_01	2nd floor displaying	0~9090【1618】	
A2_02	3rd floor displaying	0~9090【1619】	
A2_03	4th floor displaying	0~9090【1620】	
A2_04	5th floor displaying	0~9090【1621】	
A2_05	6th floor displaying	0~9090【1622】	
A2_06	7th floor displaying	0~9090【1623】	
A2_07	8th floor displaying	0~9090【1624】	
A2_08	9th floor displaying	0~9090【1625】	
A2_09	10th floor displaying	0~9090【1716】	
A2_10	11th floor displaying	0~9090【1717】	
A2_11	12th floor displaying	0~9090【1718】	
A2_12	13th floor displaying	0~9090【1719】	
A2_13	14th floor displaying	0~9090【1720】	

Function code	Instruction	Setting range 【default value】	Remarks
A2_14	15th floor displaying	0~9090【1721】	
A2_15	16th floor displaying	0~9090【1722】	
A2_16	17th floor displaying	0~9090【1723】	
A2_17	18th floor displaying	0~9090【1724】	
A2_18	19th floor displaying	0~9090【1725】	
A2_19	20th floor displaying	0~9090【1816】	
A2_20	21st floor displaying	0~9090【1817】	
A2_21	22nd floor displaying	0~9090【1818】	
A2_22	23rd floor displaying	0~9090【1819】	
A2_23	24th floor displaying	0~9090【1820】	
A2_24	25th floor displaying	0~9090【1821】	
A2_25	26th floor displaying	0~9090【1822】	
A2_26	27th floor displaying	0~9090【1823】	
A2_27	28th floor displaying	0~9090【1824】	
A2_28	29th floor displaying	0~9090【1825】	
A2_29	30th floor displaying	0~9090【1916】	
A2_30	31st floor displaying	0~9090【1917】	
A2_31	32nd floor displaying	0~9090【1918】	
A2_32	33rd floor displaying	0~9090【1919】	
A2_33	34th floor displaying	0~9090【1920】	
A2_34	35th floor displaying	0~9090【1921】	
A2_35	36th floor displaying	0~9090【1922】	
A2_36	37th floor displaying	0~9090【1923】	
A2_37	38th floor displaying	0~9090【1924】	
A2_38	39th floor displaying	0~9090【1925】	
A2_39	40th floor displaying	0~9090【2016】	
A2_40	41st floor displaying	0~9090【2017】	
A2_41	42nd floor displaying	0~9090【2018】	
A2_42	43rd floor displaying	0~9090【2019】	
A2_43	44th floor displaying	0~9090【2020】	
A2_44	45th floor displaying	0~9090【2021】	
A2_45	46th floor displaying	0~9090【2022】	

Function code	Instruction	Setting range 【default value】	Remarks
A2_46	47th floor displaying	0~9090【2023】	
A2_47	48th floor displaying	0~9090【2024】	
A2_48	49th floor displaying	0~9090【2025】	
A2_49	50th floor displaying	0~9090【2116】	
A2_50	51st floor displaying	0~9090【2117】	
A2_51	52nd floor displaying	0~9090【2118】	
A2_52	53rd floor displaying	0~9090【2119】	
A2_53	54th floor displaying	0~9090【2120】	
A2_54	55th floor displaying	0~9090【2121】	
A2_55	56th floor displaying	0~9090【2122】	
A2_56	57th floor displaying	0~9090【2123】	
A2_57	58th floor displaying	0~9090【2124】	
A2_58	59th floor displaying	0~9090【2125】	
A2_59	60th floor displaying	0~9090【2216】	
A2_60	61st floor displaying	0~9090【2217】	
A2_61	62nd floor displaying	0~9090【2218】	
A2_62	63rd floor displaying	0~9090【2219】	
A2_63	64th floor displaying	0~9090【2220】	

Above setting value can be set based on below reference table for floor displaying

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 reference table				
Displaying	p	q	r	s	t	u	v	w	x	y	z					

6.5.11 Parameters setting—I/O control board setting

【main menu】	【parameters setting inquiry】	【A3 IO board input logic setting】
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 board single point logic setting
H system information	P7 drive information	07 reserved
	PE factory only	08 reserved
	A0 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 DEC	High speed down forced DEC	Medium speed up forced DEC	Medium speed down forced DEC	LOW speed up forced DEC	LOW speed down forced DEC
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 point is set

to be 0 and NC to 1. Write the binary-to-decimal converting result to logic setting 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	Lower door area	Upper door area	Inspection down signal	Inspection up signal	Inspection signal	Emergency electric motion running
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 point is set to 0 and NC to 1. Write the binary-to-decimal converting result to logic setting 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	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 point is set to 0 and NC to 1. Write the binary-to-decimal converting result to logic setting 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.

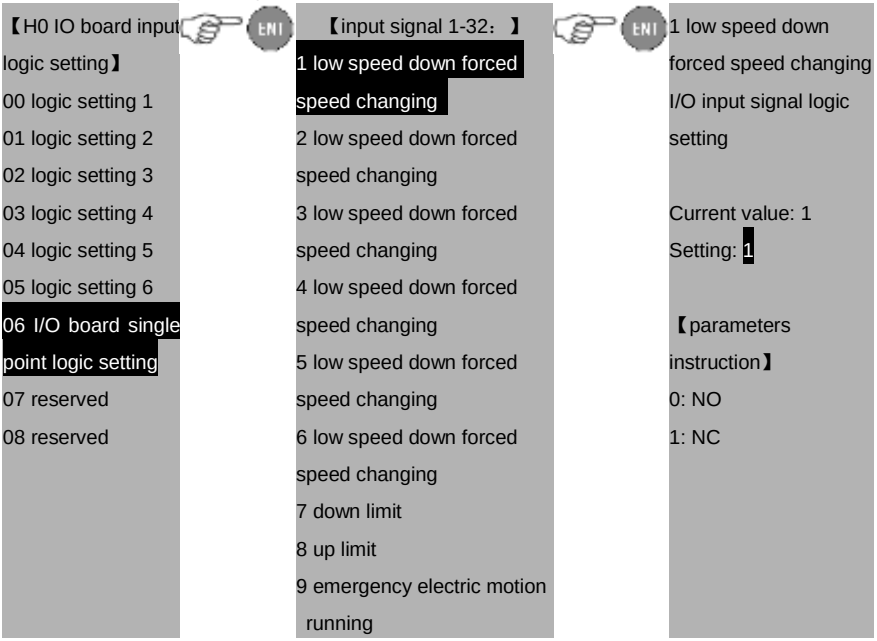
Logic setting 4 is the logic setting of the following signals:

Terminal	P32	P31	P30	P29	P28	P27	P26	P25
Definition	Customized input 3	Customized input 2	Customized input 1	Advance opening adhesion	Advance opening feedback	Hardware enable	Lobby 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 point is set to 0 and NC to 1. Write the binary-to-decimal converting result to logic setting 4.

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, the modification of which is related to logic setting 1-6 as shown below:



6.5.12 Parameters setting—setting of control board in car

【main menu】	【parameters setting inquiry】	【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 point 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
	A0 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 signal	Opening input signal	Door closed	Door open	OL	DD	Attendant
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

point is set to 0 and NC to 1. Write the binary-to-decimal converting result to logic setting 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.

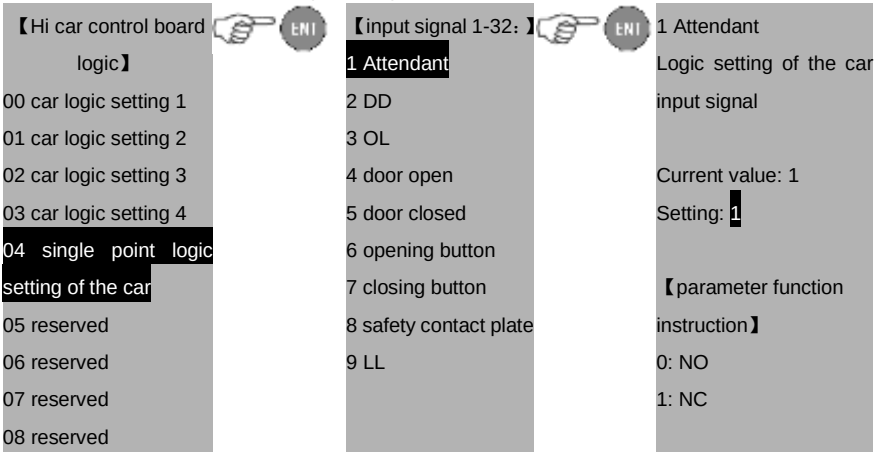
The parameter is set to 128 if the front door beam is NC.

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

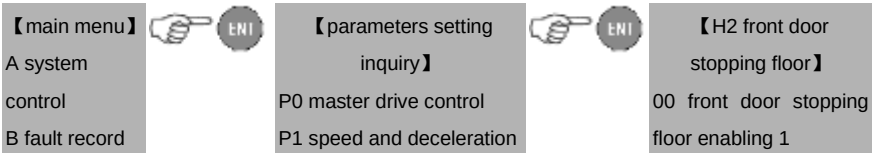
Logic setting 2 is the logic setting of below signal points:

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 signal point of main controller in the car, the modification of which is related to logic setting 1-4:



6.5.13 Parameters setting – front door stopping floor



C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

distance
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only
A0 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

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

Function code	Instruction	Setting range 【default value】	Remarks
H2_00	Front door 1~8 floor	000~255【255】	Non-modifiable 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.

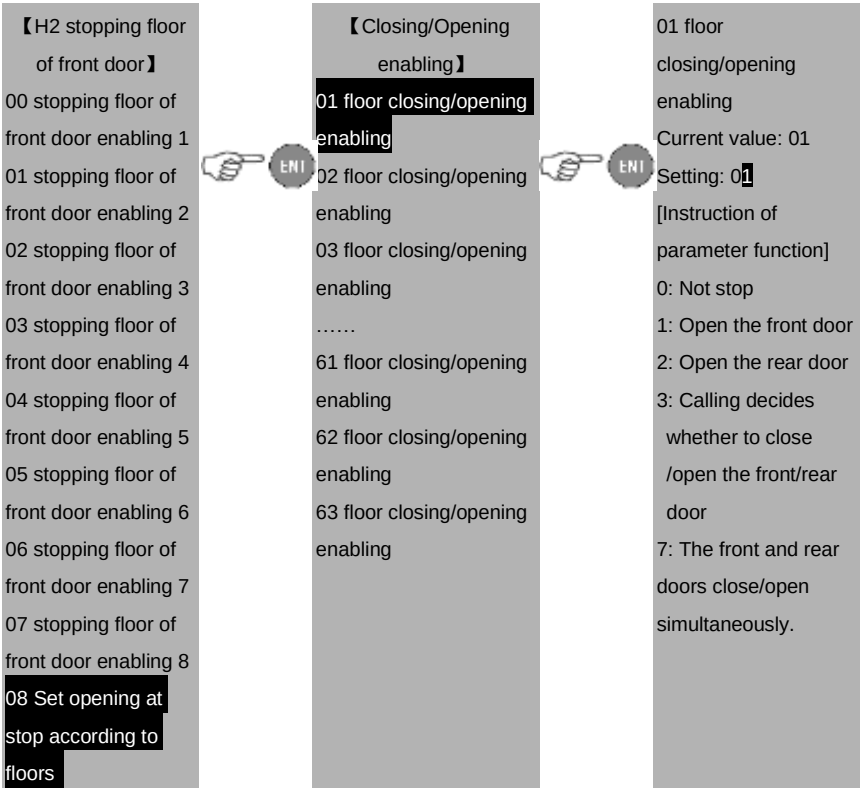
1: valid

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
1st floor	0	1	5th floor	0	16
2nd floor	0	2	6th floor	0	32
3rd floor	0	4	7th floor	0	64
4th floor	0	8	8th floor	0	128

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



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 only, 2 for opening the rear door only, 3 for opening the door

according to calling of front and rear doors or calling signals of control cabinet, and 7 for closing/opening the front and rear doors simultaneously.

6.5.14 Parameters setting – rear door stopping floor

【main menu】	【parameters setting inquiry】	【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
	A0 reserved	
	A1 floor setting	
	A2 floor displaying	
	H0 logic of IO control board	
	H1 logic of 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】	Non-modifiable in running
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】	
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

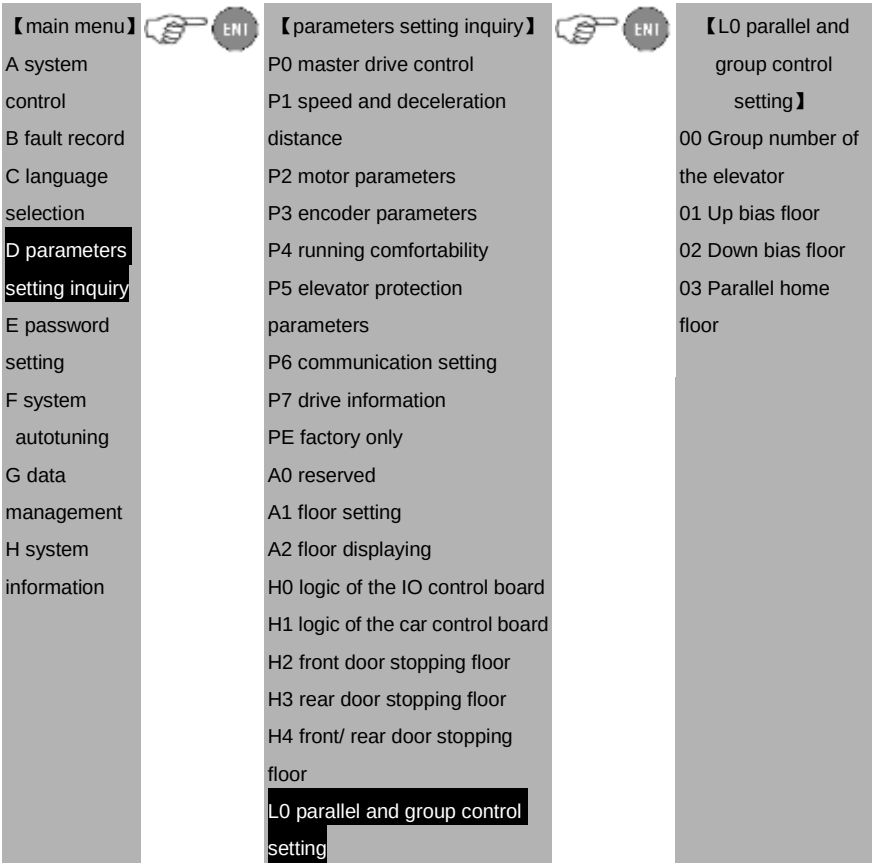
【parameters setting inquiry】
P0 master drive control
P1 speed and deceleration distance
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only
A0 reserved
A1 floor setting
A2 floor displaying
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

【H4 front/rear door stopping floor】
00 front/rear door stopping floor enabling 1
01 front/rear door stopping floor enabling 2
02 front/rear door stopping floor enabling 3
03 front/rear door stopping floor enabling 4
04 front/rear door stopping floor enabling 5
05 front/rear door stopping floor enabling 6
06 front/rear door stopping floor enabling 7
07 front/rear door stopping floor enabling 8
08 reserved

Function code	Instruction	Setting range 【default value】	Remarks
H4_00	Front/rear door 1~8 floor	000~255【0】	Non-modifiable in running
H4_01	Front/rear door 9~16 floor	000~255【0】	
H4_02	Front/rear door 17~24 floor	000~255【0】	

Function code	Instruction	Setting range 【default value】	Remarks
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



Function code	Instruction	Setting range 【default value】	Remarks
L0_00	Group number of the elevator	0~10【0】	Non-modifiable 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.

- 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 down bias for parallel elevators, always set the down bias as main elevator. Simultaneously, if there is up bias, set the top and above floors of lower floors as non-stop.

6.5.17 Parameters setting – 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 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
A0 reserved
A1 floor setting
A2 floor displaying
H0 logic of the IO control board

【T0 time setting】
00 Open delay
01 reserved
02 Returning to home floor delay
03 Idle energy saving delay
04 Brake opening delay
05 Brake closing delay
06 Starting shake prevention delay
07 Direction cancel delay
08 Inspection running delay
09 Fire fighter running delay
10 Arrival gong retention delay

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

11 Thermal protection reset delay
12 Advance opening delay
13 Creeping landing delay
14 Speed reference delay
15 Braking voltage switching delay
16 Retention time of opening delay
17 Entire running protection time
18 One-way running protection time

Function code	Instruction	Setting range 【default value】	Remarks
T0_00	Open delay	0~500s【3】	Non-modifiable in running
T0_00 set the time from door open to automatic closing.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_02	Returning to home floor delay	0~5000s【120】	Non-modifiable in running
T0_02 set the time from the idle to returning to home floor.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_03	Idle energy-saving delay	0~5000s【60】	Non-modifiable in running
T0_03 set the time from idle to entering energy-saving state.			

Function code	Instruction	Setting range 【default value】	Remarks
T0_04	Brake opening delay	0~5.000s【0.2】	Non-modifiable in running
T0_05	Brake closing delay	0~5.000s【0.4】	
T0_04: the time from given running direction to output brake; T0_05: the time from 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】	Non-modifiable in running
T0_06 set the time from lock connection to the running contactor output.			

◆ Adjust the parameter properly when the door shakes the moment it closes/ opens.

Function code	Instruction	Setting range【default value】	Remarks
T0_07	Direction cancel delay	0~5.000s 【0.2】	Non-modifiable in running
T0_07 set the time from, after brake output is closed, when the brake travel switch feedback is detected to direction cancellation (start ramps current cancellation).			

◆ Increase the parameter properly when the brake travel switch is not sensitive.

Function code	Instruction	Setting range【default value】	Remarks
T0_08	Inspection stopping delay	0~5.000s【0.300】	Non-modifiable in running
Set the time from brake cancellation to direction cancellation in inspection state, when brake travel switch is not connected, increase this value properly.			

◆ Valid when the parameter is less than 0.300, the brake and speed will cancel together, otherwise decelerate to stop based on door area range.

Function code	Instruction	Setting range【default value】	Remarks
T0_09	Fire fighter running delay	0~5.000s【0.000】	Non-modifiable in running
Set the time form elevator forced descending to entering the fire fighter state.			

Function code	Instruction	Setting range【default value】	Remarks
T0_10	Arrival gong delay	0~5.000s【0.000】	Non-modifiable in running
Set the time from the arrival gong output to canceling the arrival gong.			

Function code	Instruction	Setting range【default value】	Remarks
T0_11	Thermal protection reset delay	0~5000s【600】	Non-modifiable 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	Advance opening delay	0~5.000s【0.000】	Non-modifiable in running
T0_13	Creeping landing overtime	0~5.000s【0】	Non-modifiable in running
Set the advance opening delay time. And set T0_12 to be 0 to cancel the function. Set the protection time of creeping landing running and set it to 0 to cancel the function.			

	◆ When setting advance door open delay or creeping landing overtime, OUT1 is defined as low speed signal automatically.

Function code	Instruction	Setting range【default value】	Remarks
T0_14	Speed given delay	0~5.000s【0.500】	Non-modifiable in running
Set the time from output brake and receive the feedback to the given speed.			

Function code	Instruction	Setting range【default value】	Remarks
T0_15	Brake voltage switching delay	0~5.000s【0.000】	Non-modifiable in running
The time from output brake to braking switching.			

Function code	Instruction	Setting range【default value】	Remarks
T0_16	Retention time of opening delay	0~500s【30.0】	Non-modifiable in running
Set the time from pressing the opening delay button to automatic door close (during this period time, press the close button can close the door in advance)			

	◆ After setting this parameter, the open delay function will be enabled and following parameters will be forced to be adjusted automatically: F0-07=1, DOD in the car is defined as opening delay button; F0-15=1x, DOD at the car top is defined as opening delay light.

Function code	Instruction	Setting range【default value】	Remarks
T0_17	Entire running protection time	0~100s【45】	Non-modifiable in running
This parameter is used to limit the running time of the motor. The elevator will stop immediately when the time is reached.			

Function code	Instruction	Setting range【default value】	Remarks
T0_18	Single floor running protection time	0~100s【45】	Non-modifiable in running
This parameter is used to set the single floor running protection time, for super high floors, this parameter cannot be set to a too small value.			

Function code	Instruction	Setting range【default value】	Remarks
T0_19	Open delay at fast arrival	0~65535【0】	Non-modifiable in running
This parameter is the time from switching off output at stop to open output, the unit is 100ms. This parameter needs no adjustment in normal conditions.			

Function code	Instruction	Setting range【default value】	Remarks
T0_20	Inspection speed division delay time	0~10s【0】	Non-modifiable in running
The valid value of this parameter is 3~10s, after setting this parameter, the inspection running continues accelerating to inspection speed after accelerating to the speed retention set time of 50mm/s.			

Function code	Instruction	Setting range【default value】	Remarks
T0_21	Door operator close protection time	0~10s【0】	Non-modifiable in running
When this parameter is set to non-zero, after close output reaches the set time, it will not output close even if the door lock is blocked			

Function code	Instruction	Setting range【default value】	Remarks
T0_22	Retention time of door open	0~65535s【0】	Non-modifiable in running
0: Invalid During 1~15s, after door open output retention reaching the set time, it will carry out waiting delay			

time (T0.00), during door open output, close request is invalid.

If ≥16s, door open output will be maintained and door close request is valid after opening.

Function code	Instruction	Setting range 【default value】	Remarks
T0_23	UPS energy saving time	0~65535s【0】	Non-modifiable in running
T0_24	UPS door close delay	0~65535s【0】	Non-modifiable in running

When T0_23 and T0_24=0, enabling domestic UPS mode.

When T0_23 and T0_24≠0, enabling India UPS mode.

T0_24 starting time counting from door opening, output close; if door closed signal is detected during T0_23, OUT2 start to output after passing T0_23, otherwise starting time counting from door opening, output OUT2 (door closed signal is not detected due to beam action or door close is not completed);

Generally, the energy saving delay is larger than door close delay.

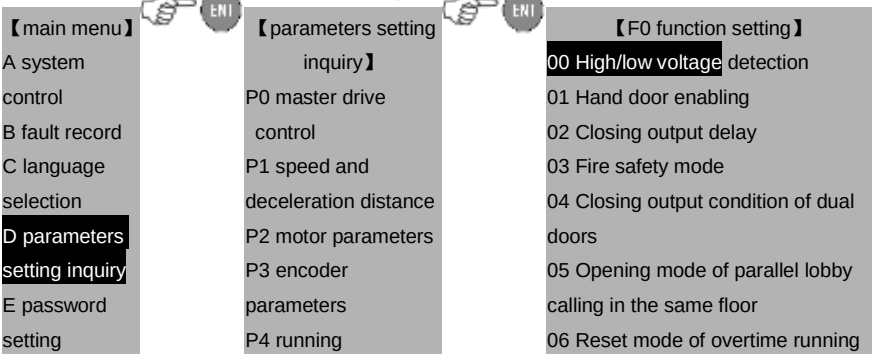
Function code	Instruction	Setting range 【default value】	Remarks
T0_26	Detection time for blocked close/open	0~65535s【20】	Non-modifiable in running

The valid value is 20~64.

Function code	Instruction	Setting range 【default value】	Remarks
T0_27	Parallel idle time	0~65535s【0】	Non-modifiable in running

When door lock disconnection time of A elevator exceeds the set idle time of B elevator, B elevator will lend support to A elevator. Generally, it is set three times of the opening retention time, when the default value is 0, idle time is taken as 40s.

6.5.18 Paramete - function setting



F system autotuning G data management H system information	comfortability P5 elevator protection parameters P6 communication setting P7 drive information PE factory only A0 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 T0 time setting F0 function setting U0 calling signal U1 system monitoring U2 hoistway information	fault 07 MF definition of IND 08 Anti-disturbance internal command limit times 09 Dual door operator control mode 10 Fire safety output 11 Internal command opening enabling within the floor 12 LINE1 multi-function definition 13 LINE2 multi-function definition 14 LINE3 multi-function definition 15 MF output in the car 16 test mode 17 relative selection of CAN communication 18 relative selection of elevator running 19 1387 encoder CD sampling 20 filter coefficient of stop curve 21 Creeping landing distance 22 UPS protocol selection 57 front door IC open floor 1 58 front door IC open floor 2 59 front door IC open floor 3 60 front door IC open floor 4 61 rear door IC open floor 1 62 rear door IC open floor 2 63 rear door IC open floor 3 64 rear door IC open floor 4 …… 98 reserved

Function code	Instruction	Setting range 【default value】	Remarks
F0_00	High/low voltage detection	0~2【2】	Non-modifiable in running
Select for the safety circuit, lobby door lock and car door lock circuit. 0: only detect high voltage, it means the controller detects high voltage BJ4 terminal only. 1: only detect low voltage, it means the controller detects 1KSAF and 1KDL in low voltage AJ2			

terminal.

2: detect high/low voltage

Function code	Instruction	Setting range【default value】	Remarks
F0_01	Hand door enabling	0~1【0】	Non-modifiable in running

0: invalid

1: arrival without open/closed detection. The elevator continues to run after switch off the door lock.

3: Cargo elevator (do not detect car board, fast running after switching off door lock)

9: Lobby door electric lock hand door

- If energy saving is necessary in this state, set the closed signal to normally closed attribute.
- After setting to lobby door electric lock hand door function, define as lobby door electric lock output function by setting mainboard multi-function output 29, which outputs when the elevator arrives or door opens at lobby calling from current floor. After passing T0.00 delay time, it will be disconnected.

Function code	Instruction	Setting range【default value】	Remarks
F0_02	Closing output delay	0~600s【0.5】	Non-modifiable in running

0: do not output closing signal after the door is closed

0.1~600.0: Maintain closing output time after door lock is connected and closed.

Function code	Instruction	Setting range 【default value】	Remarks
F0_03	Fire safety mode	0~3【0】	Non-modifiable in running

0:China fire safety

1: India fire safety

3: Special function for 2012 version fire elevator

- Britain fire safety is also applicable in Hongkong. It is necessary to enter the fire fighter running mode by DOD switch.
- As for special function for 2012, output alarm and low speed opening by OUT1 and OUT2, or output by F0-15 mapping onto car board DOD and PAS light.
- After enabling India fire safety, if there is no rear door layout, RDO on the car top board will act as up arrival gong output and RDC as down arrival gong output; when there is rear door layout, it is viable to define up/down arrival gong output by main board multi-function output.

Function code	Instruction	Setting range【default value】	Remarks
F0_04	Closing output condition of dual doors	0~1【0】	Non-modifiable in running
0: dual door output closing signal together when the door lock is blocked 1: end the corresponding closing command after door closed			

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

Function code	Instruction	Setting range【default value】	Remarks
F0_05	Floor opening mode of parallel outside calling	0~2【0】	Non-modifiable 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 overtime running fault	0~1【0】	Non-modifiable 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】	Non-modifiable in running
0: original definition 1: opening retention delay button 2: select front/rear door 3: fire fighter input in the car			

Function code	Instruction	Setting range【default value】	Remarks
F0_08	Anti-disturbance internal command limit times	0~5【0】	Non-modifiable in running
0: without LL function 1-5: record signal times limit during LL (applicable to analog weighing)			

Function code	Instruction	Setting range【default value】	Remarks
F0_09	Dual door operator control mode	0~1【1】	Non-modifiable in running
0: dual control cabinet mode 1: single control cabinet mode			

◆Set car logic setting 3 when selecting dual control cabinet mode. (Refer to the set value of car logic 1.)

Function code	Instruction	Setting range【default value】	Remarks
F0_10	Output mode of fire forced landing	0~1【0】	Non-modifiable 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	Internal command opening enabling in current floor	0~1【0】	Non-modifiable in running
0: disabled 1: enabled (applicable to IC card or no open button cases)			

Function code	Instruction	Setting range【default value】	Remarks
F0_12	LINE1 multi-function definition	0~40【24】	Non-modifiable 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:

1 undefined	21 motor thermal protection
2 no definition	22 fire action input
3 medium speed down forced speed-changing switch	23 undefined
4 medium speed up forced speed-changing switch	24 full load signal

Function code	Instruction	Setting range 【default value】	Remarks
5 high speed down forced speed-changing switch		25 overload signal	
6 high speed up forced speed-changing switch		26 undefined	
7 down limit		27 undefined	
8 up limit		28 advance opening feedback	
9 emergency electric motion running		29 advance opening adhesion	
10 inspection signal		30 Earthquake	
11 inspection up button signal		31 undefined	
12 inspection down button signal		32 undefined	
13 upper door area (rear door opening inspection)		33 open	
14 lower door area		34 closed	
15 undefined		35 UPS output inspection	
16 undefined		36 dual brake travel detection	
17 lock elevator signal		37 star-delta output detection	
18 contact point of the drive output contactor		38 UCM state detection	
19 contact point of the brake contactor		39 The third brake travel switch detection	
20 braking travel switch detection		40 Protection detection on the car top of villa elevator	

Function code	Instruction	Setting range 【default value】	Remarks
F0-15	MF output in the car	0~65535【0】	Non-modifiable in running
Ones: define RDC port of DC01 board, LED light corresponding to PAS of car top command board Tens: define RDO port of DC01 board, LED light corresponding to DOD of car top command board 0: close/open output indicator of rear door 1: opening delay button indicator 2: mapping PLC OUT1 of I/O board (following output and close of OUT1)			

3: mapping PLC OUT2 of I/O board (following output and close of OUT2)

4: low speed close signal (enabling beam overtime failure function or definable during 2012 fire elevator)

5: India DD function (trigger overturn)

Function code	Instruction	Setting range【default value】	Remarks
F0_16	Test mode	0~65535【0】	Non-modifiable in running

0: no operation

1: allow communication reset at drive fault

4: After beam action maintains 4 times of open delay time, press the close button can close the door.

8: close at fast arrival and block lobby calling (generally for debugging or test mode)

16: Cancel number clearance by double click (it is recommended to set this parameter in IC card applications)

32: Door open output is prohibited when brake action or reset overtime fault occur.

64: Enabling creeping UCM protection function.

The parameter is multi-function selective. Several functions can be effective simultaneously by adding corresponding values. For example, when number clearance by double click is not needed and the door closes at fast arrival is needed, the set value is 16+8=24.

Function code	Instruction	Setting range【default value】	Remarks
F0_17	Relative selection of CAN communication	0~65535【0】	Non-modifiable in running

0:no operation

1:open protocol

2: The overload voltage>full load voltage>light load voltage for the weighing sensor on the car top board (also applicable to weighing sensor of the engine room)

4: fast stop at door area command number clearance, if not, number clearance at deceleration point will apply.

16: Lobby calling protocol adopts internal protocol and connects with lobby calling line, if not, adopt open protocol and connect with internal calling line.

32: Adopt communication-type door operator

128: Enabling 3G monitoring

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 via lobby calling by internal protocol under open protocol, set 1+4+16=21.

◆ After changing to open protocol, re-power on the car control board or car top board after adjustment. The MF output in the car and car weighing

	compensation are cancelled. ◆ The parameter will not restore to default value.

Function code	Instruction	Setting range【default value】	Remarks
F0_18	Relative selection of elevator running	0~65535【0】	Non-modifiable in running

0:no operation

1:lobby calling within 32 floors can be connected to inside calling 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 this state.)

128: enabling standby at opening in each floor

512: Enabling blocking device of villa elevator (SUS3/SDS3 is up/down blocking switch respectively, SUS2/SDS2 is up/down travel limit)

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 monitoring selection	0~65535【0】	Non-modifiable in running

When the synchronous master lacks comfortability 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 more than 360°. Av_C is P3.07 C-phase magnetic pole bias and Av_D is P3.08 D-phase magnetic pole bias.

0:C/D phase monitoring value in drive monitoring is 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 value from 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】	Non-modifiable 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	Creeping landing distance	0~65535【0】	Non-modifiable in running
0:disable Valid range 10~200mm (modify this parameter if asynchronous motor belt drive or super-long floor steel rope slips seriously, modification to this parameter will be saved after powering off).			

Function code	Instruction	Setting range 【default value】	Remarks
F0_22	UPS application	0~65535【0】	Non-modifiable in running
0:220V power supply (The switching of drive power supply is controlled by OUT2. Set KPWR input to normally closed logic. Detect UPS output feedback and bus voltage. After leveling open delay, disconnect OUT2.) 1:380V power supply (The switching of drive power supply is completed by UPS itself. UPS bus voltage detection is unnecessary. After leveling open delay, output OUT12, KPWR input point logic is optional.)			

	◆ F0_70/F0_71 can be set to be controlled by 12-UPS.

Function code	Instructions	Setting range 【default value】	Remarks
F0_26	Time-sharing service starting time 1	0~2359【0】	Non-modifiable in running
F0_27	Time-sharing service ending time 1	0~2359【0】	
F0_28	Time-sharing service time 1 Stoppable at 1~16 floor	0~65535【0】	
F0_29	Time-sharing service time 1 Stoppable at 17~32 floor	0~65535【0】	
F0_30	Time-sharing service time 1 Stoppable at 33~48 floor	0~65535【0】	

Function code	Instructions	Setting range 【default value】	Remarks
F0_31	Time-sharing service time 1 Stoppable at 49~64 floor	0~65535【0】	
F0_32	Time-sharing service starting time 2	0~2359【0】	Non-modifiable in running
F0_33	Time-sharing service ending time 2	0~2359【0】	
F0_34	Time-sharing service time 2 Stoppable at 1~16 floor	0~65535【0】	
F0_35	Time-sharing service time 2 Stoppable at 17~32 floor	0~65535【0】	
F0_36	Time-sharing service time 2 Stoppable at 33~48 floor	0~65535【0】	
F0_37	Time-sharing service time 2 Stoppable at 49~64 floor	0~65535【0】	
F0_38	Time-sharing service starting time 3	0~2359【0】	Non-modifiable in running
F0_39	Time-sharing service ending time 3	0~2359【0】	
F0_40	Time-sharing service time 3 Stoppable at 1~16 floor	0~65535【0】	
F0_41	Time-sharing service time 3 Stoppable at 17~32 floor	0~65535【0】	
F0_42	Time-sharing service time 3 Stoppable at 33~48 floor	0~65535【0】	
F0_43	Time-sharing service time 3 Stoppable at 49~64 floor	0~65535【0】	
Time parameters adopt 24-hour system, when starting time is different from ending time, the time-sharing service function is enabled. According to system clock, the elevator will only stop at the set floors in corresponding time period.			

Function code	Instruction	Setting range 【default value】	Remarks
F0_57	Communication IC card open floor of front door 1~16	000~65535【0】	Non-modifiable in running
F0_58	Communication IC card open floor of front door 17~32	000~65535【0】	

F0_59	Communication IC card open floor of front door 33~48	000~65535【0】	
F0_60	Communication IC card open floor of front door 49~64	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 lot is the underground 1st floor, home floor is the 1st floor, stores are 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 floor (2nd physical floor) 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 lot (1st physical floor), stores (3rd~6th physical floor) and restaurants (13th physical floor).

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

Function code	**Instruction**	**Setting range 【default value】**	**Remarks**
F0_61	Communication IC card open floor of rear door 1~16	000~65535【0】	Non-modifiable in running
F0_62	Communication IC card open floor of rear door 17~32	000~65535【0】	
F0_63	Communication IC card open floor of rear door 33~48	000~65535【0】	
F0_64	Communication IC card open floor of rear door 49~64	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.

Function code	Instruction	Setting range 【default value】	Remarks
F0_69	Independent detection on lobby/car door lock	0~65535【0】	Non-modifiable in running
1: Adopt EC-UCM board (when the default value is 0, adopt EC-RDB board) 2: Enabling independent detection on lobby/car door lock.			

Function code	Instruction	Setting range 【default value】	Remarks
F0_70	MF definition of front door open/close relay	0~65535【0】	Non-modifiable in running
F0_71	MF definition of rear door open/close relay	0~65535【0】	
The value of tens and ones of F0_70 correspond to front door open relay KOP on I/O board; The value of thousands and hundreds of F0_70 corresponds to front door close relay KCL on I/O board; The value of tens and ones of F0_71 correspond to rear door open relay RDOP on I/O board; The value of thousands and hundreds of F0_71 corresponds to rear door open relay RDCL on I/O board;			
0 Original definition 1 Output control contactor control 1 2 Star-delta output 3 Brake contactor control 1 4 Brake contactor control 2 5 Fire return		15 Forced door close output 16 Elevator up signal 17 Elevator down signal 18 Important fault signal 19 Turkey creeping UCM fault output 20 Security floor time period output	
6 Front door open output 7 Front door close output 8 Rear door open output 9 Rear door close output 10 Advance door open output 11 Low speed signal 12 UPS control 13 Lock elevator and return 14 Energy saving output		21 UCM detection request 25 Down arrival gong 26 Up arrival gong 27 Fire opening overtime fault 28 Fire decreasing door close output 29 Lobby door electric lock output 31~94 correspond to door area output of 1~64 floor 95~99 Undefined	
For instance,: When defining KOP as star-delta output, RDOP as energy saving output and RDCL as elevator up signal.			

- The front door open/close relay output KOP of I/O board is the same with the common terminal of KCL
- The rear door open/close relay output RDOP of I/O board is the same with the common terminal of RDCL

Function code	Instruction	Setting range 【default value】	Remarks
F0_75	Analog LL setting voltage	0~65535【0】	Non-modifiable in running
F0_76	Analog FL setting voltage	0~65535【0】	
F0_77	Analog OL setting voltage	0~65535【0】	
When set P4.23 to non-zero value, the loading state can be obtained by setting F0_75, F0_76 and F0_77 without the need for weighing autotuning, however, the premise is that the voltage value of the elevator sensor under different loading state is well known.			

Function code	Instruction	Setting range 【default value】	Remarks
F0_80	Slip test of safety gear	0~65535【0】	Non-modifiable in running
0: No operation 1: Slip test on safety gear			

Function code	Instruction	Setting range 【default value】	Remarks
F0_81	Door operator type enabling	0~65535【0】	Non-modifiable in running
It is used to modify bit0, bit4 and bit5 of F0_17.			

Function code	Instruction	Setting range 【default value】	Remarks
F0_82	Blocking time of arrival gong	0~2323【0】	Non-modifiable in running
The thousands and hundreds stand for the time when muting of the arrival gong starts (unit: hour) Then ones and tens stand for the time when muting of the arrival gong stops (unit:hour)			

Function code	Instruction	Setting range 【default value】	Remarks
F0_83	Enabling lobby calling parameter setting	0~65535【0】	Non-modifiable in running

0: No operation 1: Set lobby calling parameter by main board (including lock elevator, fire floor and data of F0_84~F0_86). 2: Main board starts NO. 10 fault (Response message of lobby calling board can be checked in U1_16 parameter, when there is no response, it displays K address). 12345: Set lobby calling address (Fast state, lobby calling displays S--, double click the lobby calling up/down button of current floor to set this lobby calling board as front door lobby calling, double click up/down button twice to set as rear door lobby calling).			
F0_84	Lobby calling function parameter 1	0~65535【0】	Non-modifiable in running
1: Inspection state, dot matrix lobby calling flickers inspection and floor number 2: Enabling the buzzer 4: Fire state, blank screen occurred to lobby calling 8: The inspection symbol for dot matrix lobby calling is JX. 16: The direction of dot matrix lobby calling adopt thin arrow 64: Enabling rear door.			
F0_85	Lobby calling function parameter 2	0~65535【0】	Non-modifiable in running
1: Non-energy saving for LCD lobby calling 2: In running, the lobby calling arrow of LCD flashes 4: LCD lobby calling displays Chinese and English simultaneously 8: The arrow rolls when specific LCD lobby calling is running 16: Fire state, lobby calling displays XF. 32: Lobby calling adhesion enabling 256: Group control selection 512: Forecasting light selection			
F0_86	Specific lobby calling T1/T2 selection	0~65535【0】	Non-modifiable in running

High bit T2, low bit T1. 1: Up forecasting light 2: Down forecasting light 3: Arrival gong 4:Over-full load 5:Fire safety 6: Lock elevator 7: Inspection 8: Fault 9: Pause 10: Up orientation 11: Down orientation 12: In operation
Above four groups of parameters are lobby calling function setting parameter.

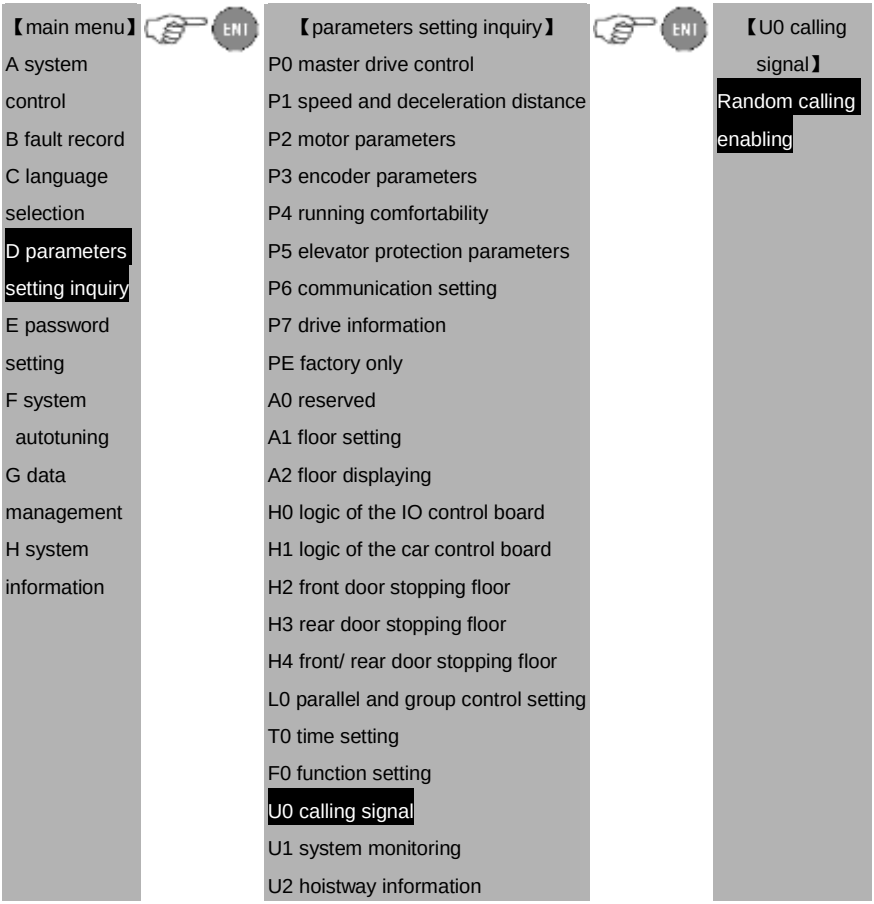
Function code	Instruction	Setting range【default value】	Remarks
F0_87	DS multi-function definition in the car	0~65535【0】	Non-modifiable in running
0: Original definition 1: Open retention delay button 2: Front/rear door selection 3: Fire fighter input in the car			

Function code	Instruction	Setting range【default value】	Remarks
F0_90	Starting speed	0~50【0】	Non-modifiable in running
F0_91	Retention time of starting speed	0~3000【0】	Non-modifiable in running
The reference speed and retention time at the start of fast running, which is used to improve the starting of asynchronous motor. Generally, the starting speed is set to around 10mm/s and the time to around 1000ms.			

Function code	Instruction	Setting range【default value】	Remarks
F0_92	Brake force self-detection enabling	0~65535【0】	Non-modifiable in running
F0_93	Brake force self-detection cycle	0~65535【15】	Non-modifiable in running
F0_94	Brake force self-detection state	0~65535【0】	Read-only

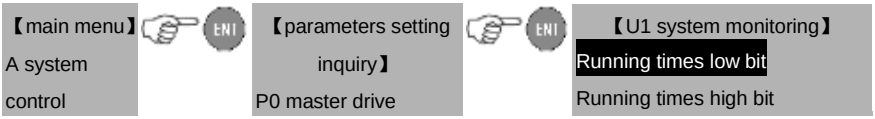
F0_95	Slip distance	0~65535mm【1】	Non-modifiable in running
F0_96	Balance coefficient	0~65535【450】	Non-modifiable in running
It is used for functions relative to brake force self-detection of asynchronous master, see details at brake force self-detection function instruction.			

6.5.19 Parameters setting – calling signal



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



B fault record
C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

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
A0 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
T0 time setting
F0 function setting
U0 calling signal
U1 system monitoring
U2 hoistway information

Total running time low bit
Total running time high bit
Current elevator reference speed
Reference frequency monitoring
Electrical angle of the master
Static autotuning detection current
C-phase sampling
D-phase sampling
Current height of the elevator
Current floor of the elevator
Leveling distance
Input terminal state 1-16
Input terminal state 17-32
Extension input terminal state
High voltage input state
Input terminal state of the main board in the car
Output terminal state
Current feedback speed of the elevator
Running state of the elevator
Output current
Output voltage
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 the car

6.5.21 Parameters setting – hoistway information

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

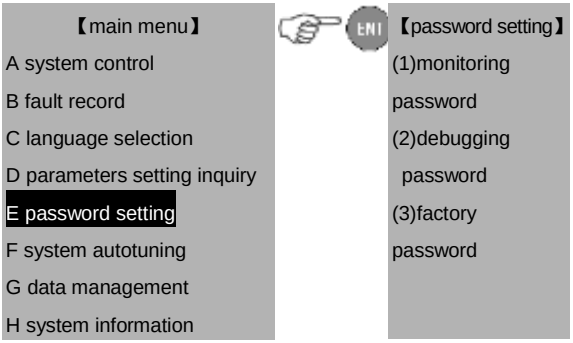
【main menu】	【parameters setting inquiry】	【U2 hoistway information】
A system control	P0 master drive control	Total height of the floor
B fault record	P1 speed and deceleration distance	Low speed down forced deceleration distance
C language selection	P2 motor parameters	Low speed up forced deceleration distance
D parameters setting inquiry	P3 encoder parameters	Medium speed down forced deceleration distance
E password setting	P4 running comfortability	Medium speed up forced deceleration distance
F system autotuning	P5 elevator protection parameters	High speed down forced deceleration distance
G data management	P6 communication setting	High speed up forced deceleration distance
H system information	P7 drive information	Longest floor distance
	PE factory only	Shortest floor distance
	A0 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	
	T0 time setting	
	F0 function setting	
	U0 calling signal	
	U1 system monitoring	
	U2 hoistway information	

6.5.22 Parameter setting- Up/down leveling adjustment

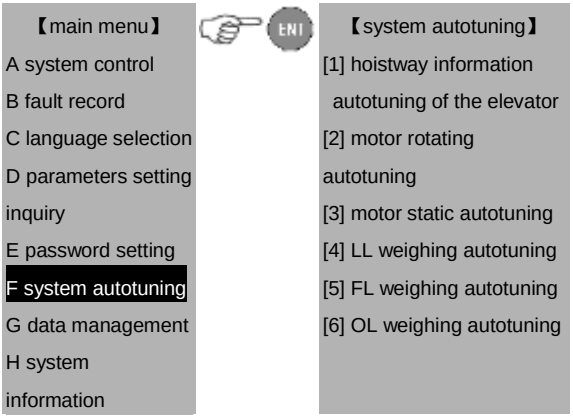
It is used for leveling adjustment on each floor, the setting method is the same with P1_14 leveling precision, PD is down leveling adjustment and PB is up leveling adjustment.

Function code	Instruction	Setting range 【default value】	Remarks
PD_00 …… PD_62	Down leveling adjustment of 1~63 floors	1~100【50】	Non-modifiable in running
PB_00 …… PB_62	Up leveling adjustment of 2~64 floors	1~100【50】	Non-modifiable in running
This group of parameters can only be valid after setting P1_14 to 50.			

6.6 Password setting



6.7 System autotuning



6.8 Data management

【main menu】		【data management】
A system control		[1] data saving of the controller
B fault record		[2] restore to the factory value
C language selection		[3] fault history clearance
D parameters setting inquiry		[4] controller data to PAD
E password setting		[5] PAD data to controller
F system autotuning		
G data management		
H system information		

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

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

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

[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】		【system information】
A system control		Software version of the main control :1.13
B fault record		Software version of the car:2.08
C language selection		Software version of the group control:0.00
D parameters setting inquiry		DSP software version: 1.08
E password setting		FPGA software version:1.04
F system autotuning		PAD software version:1.17
G data management		Rated power: 011.0kW
H system information		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, counterweight, car, steel rope, control cabinet, speed 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 lobby 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 brake 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 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 following inspection, resistor between the measuring terminal/parts and PE closes to infinity.

- Between R, S, T and PE
- Between the brake 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 grounding point and PE
- Between the shield layer of the rotating encoder cable and PE
- Between the external metal host of the rotating encoder cable and PE
- Between the grounding point of the machine and PE
- Between the grounding point of switch power and PE
- Between the grounding point of the brake 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 grounding points of the safety switches in hoistway bottom pit 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 coupling between the motor shaft and the outrigger shaft of the master is well fixed.
- 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 shielded cables. It is recommended to meld the connection wires and the wires should be isolated from each other with the metal shield.
- Connect according to the color of the connection diagram and the encoder.
- The shielded cables are connected to the grounding terminal in the control cabinet
- Encoder cable should be arranged in metal hose to the control cabinet. The ends should be connected with proper techniques and the end of the metal hose in control cabinet should be grounded.

If the shielded cable of the encoder is grounded, then it can be left unconnected, but ensure the cable

is not 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 construction outside the hoistway does not affect the running of the elevator.

2. Check the site bus voltage, the 3-phase voltage is 380±7%VAC and the phase bias is no more than 15VAC. The single phase 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 switch capacity should reach the requirements of the diagram.
4. Power on and debugging if all inspections are confirmed normal.
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.

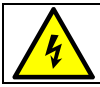
  A. Check the voltage between 24V+ and 24V- is 24.3V±0.3V.

  B. Check the close/release of relay in the control cabinet

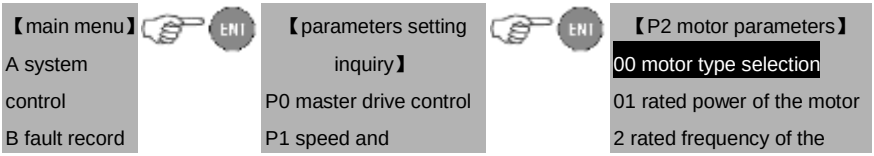
Relay name	Close/release
Phase sequence relay	Action

- Input the password on the manual operator and enter the parameters menu. After checking the parameters, set according to the actual debugging requirement.

7.3 Static self-tuning of the 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 may occur because of incorrect parameters.



C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

deceleration distance
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only

motor
03 rated speed of the motor
04 rated voltage of the motor
5 rated current of the motor
06 stator resistor of the motor
07 rotor resistor of the motor
08 Motor stator and rotor inductance
09 Motor stator and rotor mutual inductance
10 Motor no-load current

【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

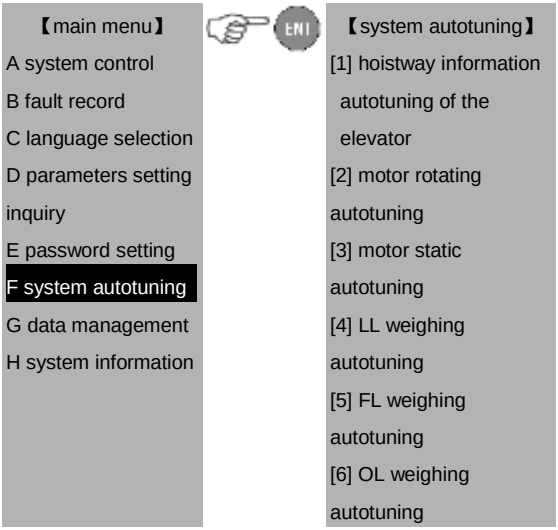
【parameters setting inquiry】
P0 master drive control
P1 speed and deceleration distance
P2 motor parameters
P3 encoder parameters
P4 running comfortability
P5 elevator protection parameters
P6 communication setting
P7 drive information
PE factory only

【P3 encoder parameters】
00 encoder type selection
01 resolution of the encoder
02 encoder direction
03 encoder disconnection detection time at low speed
04 encoder disconnection detection time at high speed
05 reversal detection time of the encoder
06 Amplitude gain of pole position
07 C-phase magnetic pole bias
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

Function code	Instruction	Instruction
P2_01	Rated power of the motor	Based on the name plate
P2_02	Rated frequency of the motor	Based on the name plate
P2_03	Rated speed of the motor	Based on the name plate
P2_04	Rated voltage of the motor	Based on the name plate
P2_05	Rated current of the motor	Based on 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 value is 0.98~1.02)
P3_07	C-phase magnetic pole bias	0000~9999 (normal value is 390~400)
P3_08	D-phase magnetic pole bias	0000~9999 (normal value is 390~400)
P3_10	Static identification current	0~150% (depend on the master characteristics, generally 40~60%)

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



Steps of	1. Check the connection of master UVW, connection wires, brake connection and

static autotuning	encoder connection. 2. Connect the safety and door lock circuit and check the parameters setting of master and encoder in the inspection state. 3. Confirm the static identification current P3_10 in encoder parameter setting, it is generally set to 40%~60% (adjust according to master characteristics), and enter the main menu—F system autotuning—[3] motor static autotuning. Then the manual operator interface 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. 4. Reconfirm the brake is in closing state, if select [YES], press the inspection up button, and then the running contactor will close automatically to begin the static autotuning and the manual operator will display the motor is autotuning. After about 0.5s, the motor will squeak to end the autotuning and the running contactor releases automatically. 5. If the master autotuning succeeds, the manual operator will display “autotuning succeed”. Press ESC to exit from the interface, and then enter main menu—G data management—[1] data saving interface of controller to save the data. If the manual operator display “autotuning failed”, return to main menu-B fault record to find the fault reason.
Precautions in static autotuning	1. During master autotuning, if any abnormality occurs, press the emergency stop button or switch off the main power supply to stop the autotuning. 2. 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%. 3. Check the detection current of static autotuning U1_07 is in 80~120%, if not, modify P3_10 and redo static autotuning. 4. During 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. 5. Judge the running direction of the elevator before the first inspection running to avoid collision limit. If the inspection running direction is different from the actual direction, change the value of P0_08. 6. Enter drive monitoring interface and inspect up/down running. 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 motor static 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】
Autotuning succeeded

If failed, then

【motor static autotuning】
Autotuning failed

- Save the parameters after autotuning.
- The autotuning of asynchronous motor is the same as above. After finishing autotuning, update P2_06 ~P2_10.
- In order to ensure the accuracy of the result of asynchronous motor static autotuning, it will take about 4 minutes to complete the autotuning with intermittent electromagnetic noise occurred during the process, please patiently wait for the autotuning to complete and the operator will show whether autotuning succeeded.

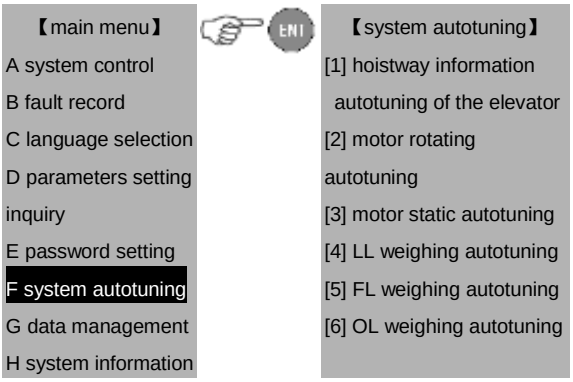
7.4 Rotating autotuning of the motor

Ensure the wire rope on the motor is removed, safety and door lock circuit is connected before the rotating autotuning and the following 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 of the motor	According to the name plate

Function code	Instruction	Instruction
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

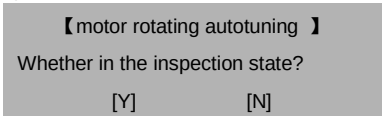
Enter the main menu and select motor rotating autotuning.



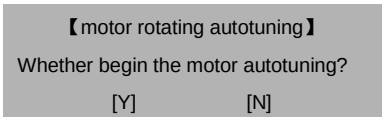
Steps of motor rotating autotuning	1. Check the connection of master UVW, connection wires, braking connection and encoder connection. 2. Ensure the wire rope on the motor is removed before the rotating autotuning and no damage may occur during rotating. 3. Connect the safety and door lock circuit and check the parameters setting of master and encoder in the inspection state. 4. Enter the main menu—F system autotuning—[2] motor rotating autotuning. Then the manual operator interface 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. 5. The brake contactor is in close state when selecting [YES]. Press the inspection up button, and then the running contactor will close automatically to begin the autotuning and the manual operator will display the motor is autotuning. After about 30s, the motor will finish autotuning and the running contactor releases automatically.

	6. If the master autotuning succeeds, the manual operator will display “autotuning succeed”. Press ESC to exit from the interface, and then enter main menu—G data management—[1] data saving interface of controller to save the data. If the manual operator display “autotuning failed”, return to main menu-B fault record to find the fault reason.
Precautions in autotuning	1. During master autotuning, if any abnormality occurs eg the drive board squeals or heated-up noticeably or there is smoke or abnormal odor, release inspection up button immediately, then press the emergency-stop button or switch off the main power supply to stop the autotuning. 2. If the autotuning is failed, first confirm the brake is closed or not. 3. If the master vibrates during autotuning, enter parameters of P4 group to reduce speed loop KP and current loop KP. 4. If the master rotates abnormally and alarms encoder disconnection, repeat rotating autotuning after modifying encoder direction P3_02. 5. Record and compare the value of P3_09 in three times of autotuning. If the deviation is small and the running current at no-load is normal, the autotuning is successful; otherwise, check if the setting of P0, P2 and P3 is consistent with parameters of the nameplate and encoder and confirm the autotuning steps are strictly followed. 6. Judge the running 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.

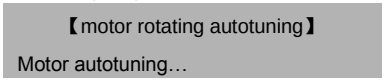
Enter motor rotating autotuning:



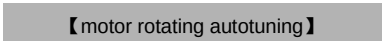
Select [Yes] and enter:



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



If succeeded, then



Autotuning succeeded

If failed, then

【motor rotating autotuning】
Autotuning failed

- 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 main 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 lobby door
4. Smooth up and down limit circuit
5. The up/down forced deceleration circuit need to keep smooth, otherwise the actual running speed is the leveling speed during 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 operator can display the current running speed or frequency when the elevator is running.

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

(3) Enter 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 operator. The up running is the positive value and the down running is the negative value. If abnormal, enter the parameters setting—encoder parameters—pulse counting direction to the change the value.

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

(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, enlarge inspection stop delay T0_08.

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, add 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 terminal leveling position corresponds to each deceleration distance of each speed stage.

7. The connection of the interphone is correct and can work normally.
8. The connection of the arrival gong 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.

(1) check the connection of J3 on DC-03A board in the car.

(2) ensure the cable of the hoistway communication module stays at about 60Ω.

(3) ensure the cable of the car communication module stays at 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 confirmed and checked following the procedures in section 1:
   (1) Switch off the power supply.
   (2) Ensure all switches are off.
   (3) Ensure inspection/automatic switches on the control cabinet 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 construction.
2. Inspection and debugging of the door operator
   (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 operator of the control cabinet and turn the

inspection/automatic switch into inspection position.

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

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

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

A. Set the door operator in 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 opens 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 turn the inspection/automatic switch into normal position and the door is closed.

B. The manual operator should display automatic state.

3. Inspection of the beam

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

Inspection on car display:

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

(2) Confirm the car display is correct and change with the displaying on the manual operator 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 and limit switch.

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

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

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

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

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

5. Inspection and adjustment of the terminal forced deceleration switch

(1) Terminal forced deceleration switch is divided into up terminal forced deceleration switch and down terminal forced deceleration switch.

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

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

(4) 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 on 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 to 0.20m/s and the elevator is in 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 is correct.
3. Keep the safety circuit smooth.
4. Ensure the safe running of the elevator in the hoistway.
5. Enter the autotuning menu through manual operator.

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

【main menu】	ENT	【system autotuning】	ENT	【hoistway information autotuning】
A system control		[1] hoistway information autotuning		Please confirm the position of the forced speed changing switch?
B fault record		[2] motor rotating autotuning		[Y] [N]
C language selection		[3] motor static autotuning		【forced speed changing distance instruction】
D parameters setting inquiry		[4] LL weighing autotuning		First level: 1200mm
E password setting		[5] FL weighing autotuning		Second level: 2400mm
F system autotuning		[6] OL weighing		
G data management				
H system information				

	autotuning	
Select [Y] to enter	Select [Y] to enter	Select [Y] to enter
【hoistway information autotuning】 Please ensure the inspection state? Please ensure it is in inspection state? Whether the car is in the door area of ground floor? [Y] [N]	【hoistway information autotuning】 Please confirm to begin the hoistway information autotuning of the elevator? [Y] [N]	【hoistway information autotuning】 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 hoistway autotuning at the inspection speed and record the position of each leveling plate and the up/down terminal deceleration switches.

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

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

【hoistway information autotuning of the elevator】
Succeeded.

(3) Save the autotuning data and exit the displaying of the manual operator to the state window.

If failed, then

【hoistway information autotuning of the elevator】
Failed.

- 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 installed flux-insulation/light panel in door area is different from the total floor setting or the installation position deviation occurred. Please note if signal changes in door area is in consistent with the total floor number.
- Low speed down forced deceleration switch does not reset or is disconnected;
- Low speed up forced deceleration switch is adhesive or the installation position is too high.
- Redo hoistway autotuning each time the deceleration switch is adjusted.

8.5 Panel operation

Calling, hoistway autotuning and master autotuning can be done by UP/DOWN button on EC100 panel. The operational method is as below:

In floor displaying interface, press DN for 3s to enter menu item F0 (press UP to display fault record); In F0 interface, press UP for 0.5s to increase the menu (press DN to enter the menu item) until reaching F4, then exit and display current floor number.

8.5.1 Panel calling F0

In F0 interface, press DN to display registered floor number, then press UP to increase the registered floor number, (keep it pressed down to increase continuously, when reaching total floor, it will change to 1), select the to-be-registered floor address and press DN to confirm the calling and return to F0 interface automatically.

8.5.2 Panel hoistway autotuning F1

In F1 interface, carry out inspection running until reaching door area of ground floor, press DN to display "---"(overturn inspection can return to F1), then press inspection up to start hoistway autotuning, and floor number will be displayed with two decimal point flashes. When autotuning is succeeded, it will display OP, if failed, it displays Er.

8.5.3 Panel master dynamic autotuning F2

In F2 interface, under inspection state, press against brake contactor, and press DN and two binary numbers flashed, the definition is as below:

00: P3.02=0 P3.12=0

01: P3.02=0 P3.12=1

10: P3.02=1 P3.12=0

11: P3.02=1 P3.12=1

Press UP to modify the value of P3.02 and P3.12 (00-01-10-11), press DN to flash ".." (overturn inspection can return to floor displaying), press inspection up to start rotating autotuning, when the master is rotating, "--" will flash. After autotuning is succeeded, OP will be displayed then the initial position of magnetic pole will flash twice (eg 123.45, first displays "12", then display 3.45, repeat twice).

8.5.4 Panel master static autotuning F3

Refer to F2 dynamic autotuning for operational process (the difference lies in there is no need to hold up against the brake contactor). When static autotuning is abnormal, repeat static autotuning and the static identification current percentage can be modified automatically.

8.5.5 Panel safety gear slip test F4

In F4 interface, press DN to display 00 in inspection state, press UP to modify value 01, press DN again to confirm slip test, and "01" will be displayed. After slip test is done, press UP to exit to floor

display interface.

8.6 Run at fast speed

	◆ Avoid terminal landing running in first running at fast speed.
	◆ Ensure each safety switch in safety circuti is reliable and can act normally. ◆ Ensure there is no short circuit of the car and lobby door lock and the locks can work normally. ◆ Ensure forced deceleration switches and slow limit switches can work normally. ◆ Ensure the hoistway autotuning is succeeded, and the logic setting of the I/O board and car main controller is correct. ◆ The elevator runs at slow speed to the terminal leveling. Correct the floor displaying and inspection turns out normal. The elevator opens and closes the door automatically to ensure internal/lobby calling communication is normal.

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

1. Ensure there is nobody in the car, car top or pit and the doors of the lobby 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 the starting, acceleration, deceleration, leveling and stopping actions are normal, if not, adjust relevant parameters.
3. After single-deck running is normal, input double-deck command and make the elevator run at double-deck speed to check whether above-mentioned actions are normal, if not, adjust relevant parameters.
4. After double-deck running is normal, input multi-deck command to check whether above-mentioned actions are normal, if not, adjust relevant parameters.
5. After multi-deck running is normal, make the elevator run at multi-deck speed to the top and bottom to check whether it is in normal state.
6. After top/bottom running is normal, check if the valid distance of up/down forced deceleration switch meet the requirements, then make the elevator stagger floors upward and downward respectively, observe whether top-hitting or bottom-clashing occurred when the elevator reaches the top floor and bottom floor, if abnormal; adjust the distance of up/down forced deceleration switch

	◆ Reperform the hoistway autotuning each time the up/down forced deceleration switch is adjusted.

8.7 S Curve adjustment

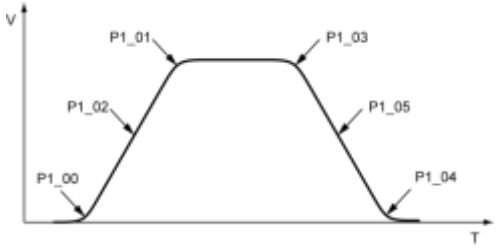


Figure 8-1 S Curve adjustment

8.8 Leveling adjustment

8.8.1 Instructions for leveling adjustment

1. The leveling plate are plugged in the photoelectric switch or magnetic switch for about 2/3 depth and ensure the plug-in depth of each plate is the same and as vertical as possible.
2. Keep the center of the plate and sensor in one line during installation.
3. Record the height difference between the car sill and lobby door sill when the elevator goes up/down to each floor. When the elevator goes up: if the car sill is higher, it indicates over-leveling and lower indicates under-leveling; when the elevator goes down: if the car sill is lower, it indicates over-leveling and higher indicates under-leveling.
4. Leveling adjustment:

Decrease P1_14 properly if the up/down leveling precision are both under-leveling, the reference value is 50-x; if up/down leveling precision are both over-leveling, increase the range of leveling precision parameter properly, the reference value is 50+x.

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

Ensure the encoder adopts shielded cable, and the shielded layer needs to be grounded in one end of the control cabinet. During wire layout, please note that encoder cables and power cables cannot be routed in the same cable tray.

8.8.2 Leveling adjustment on each floor

Adjust up/down leveling of each floor by setting PB/PD parameter groups.

8.8.3 Leveling adjustment in the car

1. Set F0.23 to 8 (or LL and FL acts simultaneously in attendant state), the elevator runs to the top floor automatically and keeps the door open, entering car leveling adjustment mode;
2. Trigger internal command of top and bottom floors based on last running direction, increase/decrease leveling precision value of elevator arrival in corresponding direction, press door open/close button simultaneously for storage (when modifying parameters, internal display panel will display corresponding content, 0 means the leveling precision value is 50 by default);
3. After restoration of F0.23 or attendant reset, exit from car leveling adjustment mode.

- Reperform the hoistway autotuning after adjust the leveling switch, magnet vane or forced deceleration switch.
- Leveling adjustment on each floor can be realized only when P1.14 is set to 50.
- The range of leveling adjustment in the car is +/-30mm.

8.9 Comfortability

8.9.1 Vector control of the sequence in fast-running

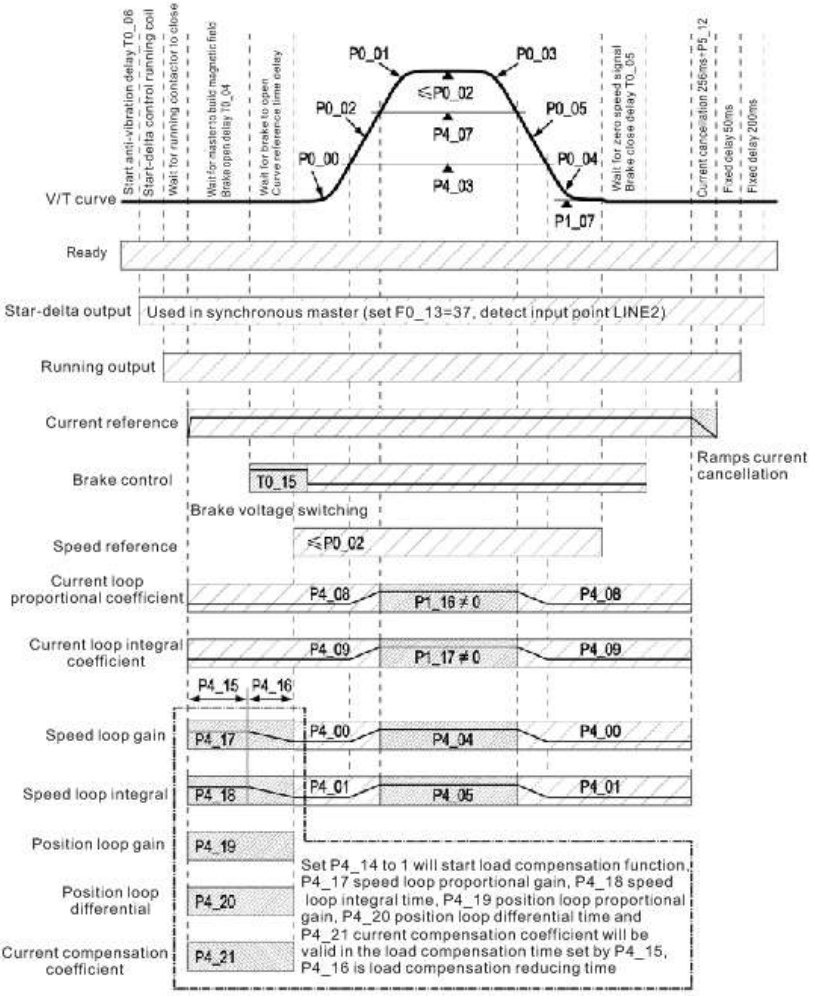


Figure 8-2 Sequence diagram

8.9.2 Adjustment of non-weighing compensation starting

1. Set P4_14 to 1, valid in the time set by P4_15**,** P4_17, P4_18, P4_19 , P4_20 and P4_21.
2. P4_16 is the transition time from speed loop zero speed (load compensation) to 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 properly when vibration occurred during adjusting the load compensation speed loop.
5. There is no need to set position loop parameters. Too high P4_19 may cause motor vibration.

	◆ When this function is applied to asynchronous motor, it is required to increase P4.19 to more than 1s, otherwise vibration may occur.

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 integral time can adjust the dynamic response of the speed loop in vector control, however, too large proportional gain or too small integral time may easily cause system oscillation and too large overshooting. Too small proportional gain may easily cause steady oscillation of the system and static deviation of the speed.

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 through the linear change of these two groups of parameters.

8.9.4 Adjustment of the current loop

The adjustment of P4_08 and P4_09 will impact the dynamic response speed and control performance of the system. Too strong PI parameter will cause high frequency oscillation of output current and generate motor noise; too week PI parameter will cause motor vibration during low speed running.

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

Generally, P4_08 is increasing with the sudden inductance of the motor and 4_09 is increasing with the resistance of the stator.

8.9.5 Motor noise adjustment

During running, if motor noise occurs, first check if P0_07 is 6kHz or 8kHz, which it should be, then adjust P4_08, P4_09 and P4_10 properly.

When asynchronous motor is running, if motor noise is caused by output voltage, increase the slip of corresponding load direction.

8.9.6 Parameters relative to comfortability

Fast running state	Relative parameters
Slide at the heavy side when starting	For synchronous motor, Adjust P4_14, set P4_15, reduce P4_18 and increase P4_17 (if noise occur after increasement, adjust P4_21:-1000~+4000), it is also viable to increase P4_00 properly
Starting vibration	Increase P4_18, reduce P4_17 (if slide occurs, adjust P4_21)
Rapid acceleration/deceleration	Reduce P1_02 and P1_05. Note: The ratio between acceleration and acceleration-increasement should be no more than 3, the same applies to deceleration and deceleration decreasement.
Vibration during ACC/DEC	Adjust P4_03 and P4_07
Vibration at the end of ACC/DEC	Adjust P1_01 and P1_04
Stopping vibration	Reduce P4_00 or start current loop switching, reduce P4_08 and P4_09, increase P1_16 and P1_17.
Slide at heavy side when stopping	Increase T0_07 and P4_00
Slide at running side when stopping	Increase P4_00(when noise occur, low speed integral time is 0.1s), decrease the torque compensation of current loop filter coefficient bit0~bit2 (no more than 3)
Low-speed vibration	Adjust P4_00, P4_01, enhance P4_08 and P4_09
High-speed vibration	Adjust P4_04, P4_05
Entire running vibration	Adjust P4_08, P4_09, P4_02, P4_06 (no more than 3) and P4_10.

◆ Please start current loop switching function when elevator characteristics changes with the load (eg light load is normal but noise and resonance occur during full load), the original P4_08/P4_09 act as the proportion and integral of low speed current loop, the set P1_16/P1_17 act as proportion and integral of high speed current loop

8.9.7 Adjustment of weighing compensation

When the synchronous master adopts UVW encoder or pulley drives the asynchronous motor, the device for weighing compensation will be necessary. If it is installed at the rope end of the engine room, the compensation signal will be connected to AI1 and GND of EC100 main board, and set P4_23=0 and P4_24=2. If it is installed on the weighing proximity switch at the car bottom, EC100 autotuning at LL, FL and OL will be needed, the procedures are shown below:

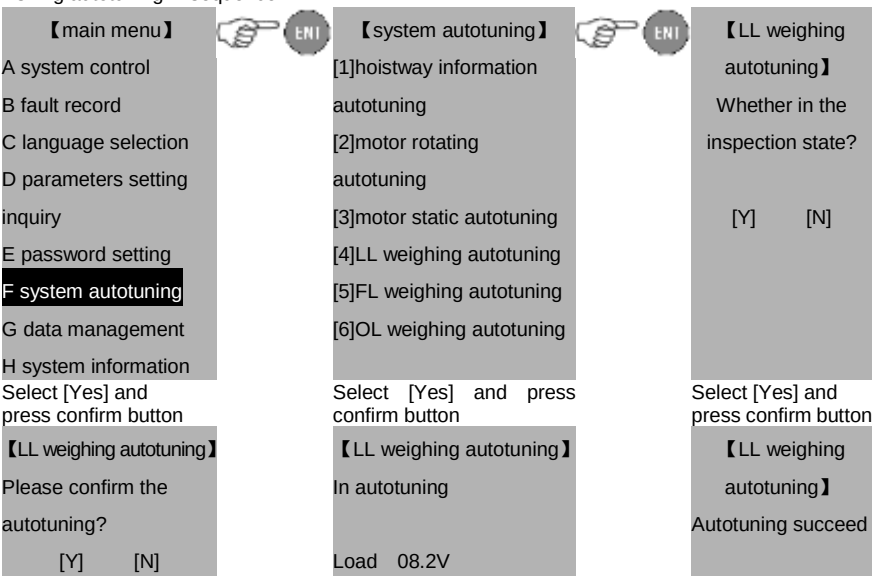
1. Fix the weighing sensor approaching to the center of the car bottom and place it in horizontal,

about 20mm from the car bottom;

2. Set P4_23 to 1, P4_24 to 1;

3. In inspection state, keep the car at light load, adjust the position of the sensor, and make input voltage to car top board close to 8V (monitoring by checking U1_32, if the selected sensor is of low voltage in light load state, the installation position should be close to 2V);

4. Enter following setting interface and conduct LL, FL and OV autotuning. Data will be saved after finishing autotuning in sequence.



After autotunings are succeeded, set P4_25, P4_26 and P4_27 to adjust starting compensation.

Set P4_25 to the analog voltage value of the elevator during balanced load. For instance, when elevator is in balanced load, the “analog input voltage” in drive monitoring is 4V, then this value should be set to 40.0%;

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

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

⚠	◆ In addition, it is viable to input F0_75~F0_77 to act as voltage value for LL, FL and OL state respectively (unit: 0.1V, for instance, when the voltage corresponds to FL is 3.2V, then set F0_76 to 32), thus saving autotuning operation. ◆ When the LL voltage is less than FL voltage for the selected sensor, it is required to set bit1 2) of F0_17.

8.10 Self-detection on brake force

8.10.1 Manual monitoring process

1. When the car is empty and in stand-by mode, set F0.95=12345 by operator (or trigger inspection up button three times in a row in fast running state), the elevator will runs to the middle floor automatically (runs to the top floor for double floor station) and does not open the door at stop;

2. Add excitation current to the system, remain zero speed after switching off, record retention torque of empty car and switching on to stop, projecting on this basis, calculate the retention torque under 125% load (this procedure can only be done in manual monitoring);

3. In switching on state, the system offers running speed of 10mm/s and judges the monitoring result (report NO. fault when non-conformity occurred)

8.10.2 Periodic automatic monitoring instruction

1. Set F0.93 as self-detection days. Each time upon more than 20 hours' powering up of the elevator, start counting idle waiting time of elevator in fast running state, after 10 minutes, enters self-detection process automatically: the elevator runs to the middle floor (runs to the top floor for double floor station), in switching on state, system offers running speed of 10mm/s and judges monitoring result;

2. Then enters the last four hours in monitoring cycle, start counting idle waiting time of the elevator, after passing 10 minutes, enter above self-detection process again (when the elevator runs at high frequency during long-time and the idle waiting time cannot meet 10 minutes, the system, after overtime, will continue idle waiting time instead of entering the next self-detection cycle).

8.10.3 Basis for self-detection judgement

1. During monitoring process in switching on, when the tractor experiences more than 40mm rotation, it is judged as non-conformity;

2. During monitoring process in switching on, the torque current offers force after reaching the calculated retention torque for 125% load and delaying 3s, at this time, if the accumulated position deviation of the tractor is no less than the set value (1mm by default) of F0.95, it is judged as non-conformity;

3. After the elevator enters manual monitoring or automatic monitoring process, if self-detection is unavailable due to the brake travel switch acts abnormally or the torque does not reach the calculated value after switching on and monitoring for 30s, or due to door lock or other reasons, it is judged as non-conformity;

4. After the elevator enters manual monitoring or automatic monitoring process, if the brake travel switch acts normally, the tractor does not experience more than 40mm rotation during switching on and monitoring, the torque reached calculated value during 30s and the accumulated position deviation of the tractor is less than the set value of F0.95, it is judged as conformity;

8.10.4 Adjustment on monitoring torque

Set elevator balance coefficient by F0.96 (450 means 45.0%), thus adjusting the test torque of calculation.

8.10.5 Reset condition for brake force self-detection fault

When NO.8 fault occurred, after inspection brake mechanism, carrying out manual monitoring process, after these procedures are done successfully, the fault will reset.

8.11 UCM detection instruction

8.11.1 UCMP function detection procedures

Instruction of synchronous motor UCM function: the synchronous motor adopts EC-RDB board to realize UCM detection function, during advance opening or creeping landing running, when middle door area disengages or upper and lower door area disengage simultaneously, the safety circuit board will cut off door lock short circuit, power-lossing of brake contact will be imposed to achieve stopping purpose.

Instruction of asynchronous motor UCM function: the asynchronous motor adopts EC-UCM board to realize UCM detection function, in vice door lock disconnection state (namely the door is actually open), when the car moves accidentally and cause middle door area to disengage or upper and lower door area to disengage simultaneously, the additional braking unit of safety circuit will cut off the circuit to achieve stopping purpose.

Test procedures: Set T0.13=5.0s; F0.16=64, apply inspection running to disengage the upper or lower door area of the car, modify P0.08 and operate normal, then the elevator will creep in the contrary direction until reaching the middle door area and disengages, the system reports NO.80 fault, now P0.08 needs to be restored;

Reset mode: After stopping reset, apply inspection running to run to door area and after inspection shows normal in three consecutive inspections, the fault will be reset.

8.11.2 UCMP stopping distance detection step

1. The elevator runs to the middle floor and stops at the door area (upper/middle/lower door area all act), remain closing state;
2. Inspect control cabinet, apply UCMP test switch and simulate door lock disconnection;
3. Set F0.78 to 1 and enable UCMP test to make the elevator enter UCMP test state, short circuit the door lock;
4. Apply inspection down running or up running, when the elevator test running disengages the middle door area: the door lock short circuit of synchronous safety circuit board EC-RDB is disconnected, the brake power losses for stopping; the A40-A50 additional braking units of EC-UCM triggers circuit to stop.
5. After disengaging door area, when the speed does not reach scheduled max. speed, increase the calculating speed (0.25mm/s by default) when F0.79 disengaging the door area, redo UCMP test until test requirement is met.

Chapter 9 User-specific design—Programmable logic control

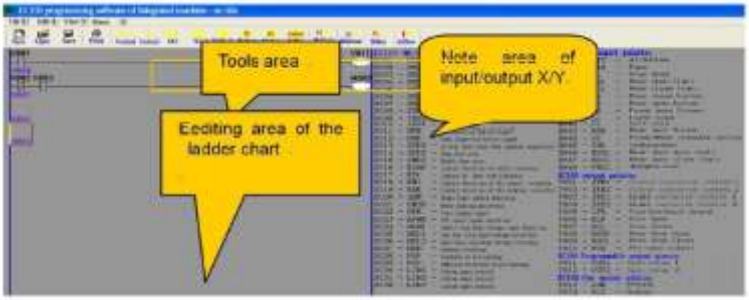
9.1 Introduction

EC100 elevator intelligent integrated machine provides two multi-function output points for secondary development platform. Users can use the existing input and output points to make logical combination for output. The program supports 300 steps to the max. extent, thus meeting the need of users.

9.2 Programming software

Programmable design is conducted via program software. After installing program software of the integrated machine to PC, use program cable to connect with EC100 to realize program download.

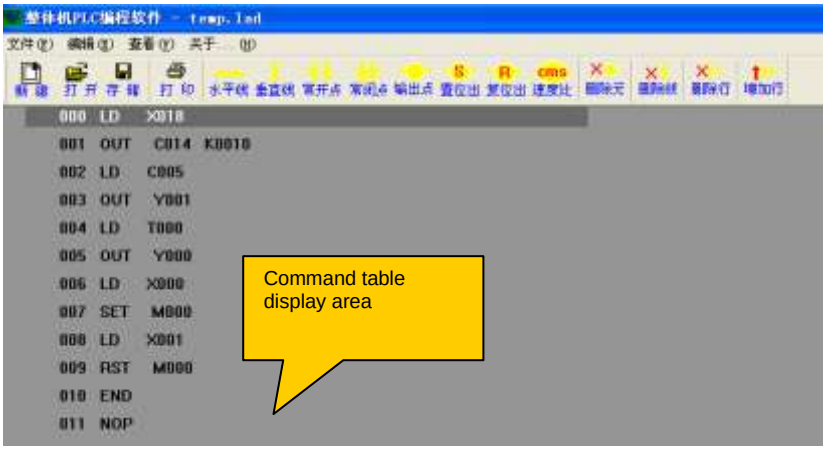
Software interface:



9.2.1 Shifting between the ladder chart and the command table

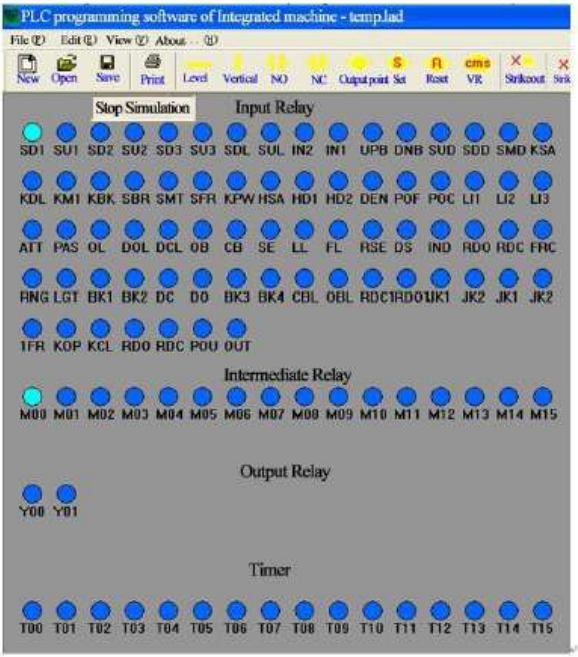
Click the ladder chart to enter the program editing state of the ladder chart:

Click ladder chart command to enter command table button, enter the interface for switching between ladder chart and command table as shown below



9.2.2 Logic test

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



Start the simulation and users can forceably simulate result on ON/OFF of input relay and intermediate relay as needed.

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 language and does not provide command table program. The command table is used only for ladder chart conversion. Ladder chart program adopts sequential control signal and soft component number and the sequential control circuit diagram is drawn and indicated by contact and coil for easy comprehension in graphic pages. Meanwhile, the action of programmable controller can be monitored via the state displayed by circuit.

For example:

There are many relays, timers and counters in the programmable controller with numerous common NO and NC contacts.

The connection of these contacts and coils compose the sequential control circuit. Below is the introduction of some soft components.

9.3.1 Input relay X

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

The configuration of X address is shown as below:

9.3.2 Output relay Y

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

9.3.3 Assistant relay M

The assistant relay is the relay inside the controller and is indicated by M.

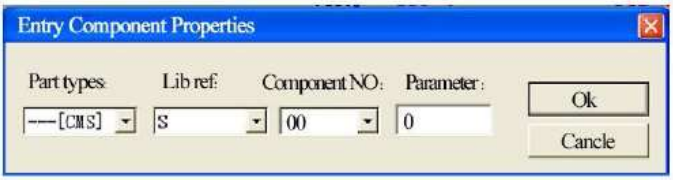
Address configuration principle: 16 assistant relays M00-M15

- The relay is different from input/output relay. It is used only in the program and cannot receive the external input or drive the external load directly.
- Note that there is no power-off retention function in the assistant relay.

9.3.4 Current speed comparison command CMS

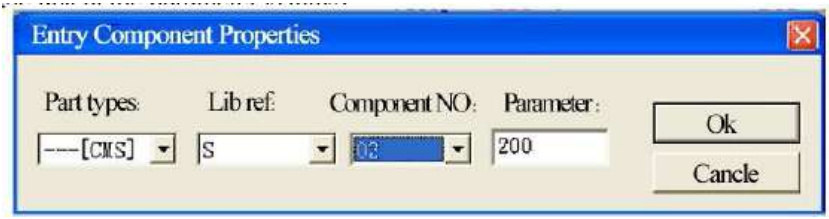
It is used on the relay output at the regulated speed.

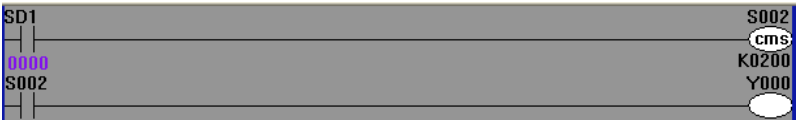
For example:



Speed comparator S，when SXX is larger than the set parameter （XX is any one of the component code in 00-07）, the unit of the parameter is mm/s

For example:



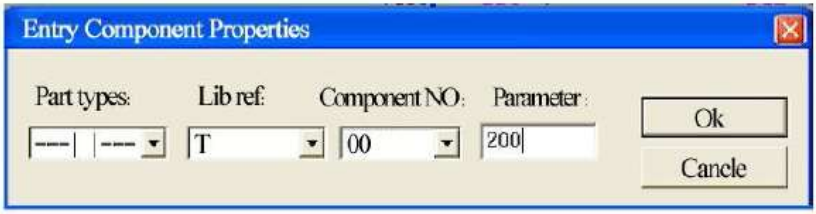


9.3.5 Timer T

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

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:

It means when the elevator low speed forced deceleration does not act, if elevator speed is larger than 0.2m/s, output Y000 in T000 (20s).

The min. unit of the timer is 0.1s. The counter adopts rising edge triggering mode and the largest step number is 300.

9.3.6 Counter C

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

- Internal counter (general use/used for power off retention function)
- 16-bit counter: increasing counting; counting range: 1~65535

C00-C09 are for general use, C10—C15 are used on the internal signal of the controller. Its response

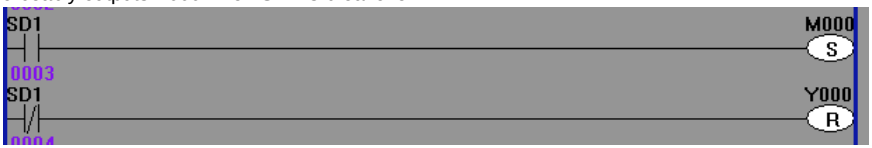
speed is 10ms/time.

The figure above means output Y001 when the accumulative opening times of the braking unit reach 2000.

9.3.7 Setting command S

The role of forced output relay: act as the relay for step ladder chart and is indicated by S.

Forceably outputs Y000 when SD1 is breakover.



9.3.8 Reset relay R

The role of forced reset relay: act as the relay for step ladder chart and is indicated by R.

Forceably resets Y000 when SD1 is disconnected.

Chapter 10 Instruction for supporting items

10.1 Main controller DC-01 of the car

DC-01 is the main control board of the elevator car. It includes 16 digital signal input, 2 relay NO signal output, port for connecting with DC-02 and internal command signal input of 12 floor elevator and CAN terminal for communicating with EC100.

10.1.1 Installation dimension

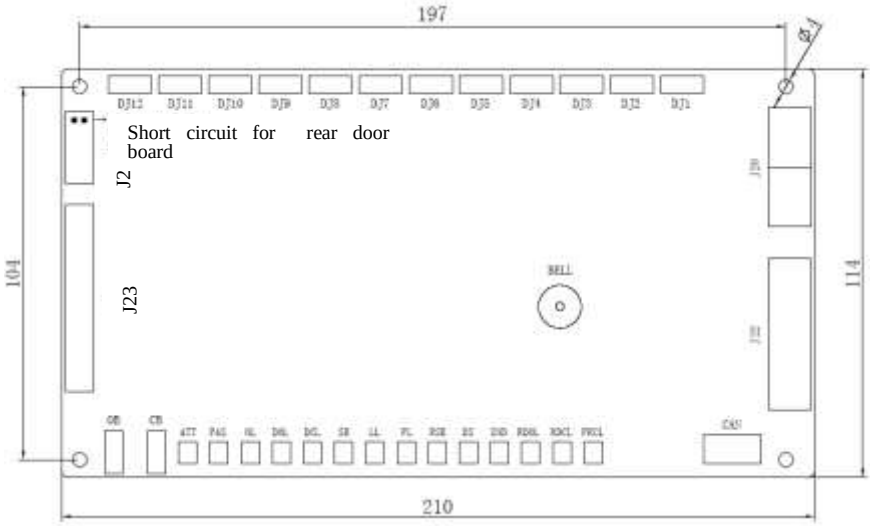


Figure 10-1 Installation dimension of the car main controller DC-01

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)	Full output of relay	24*0.03=0.07W
	Running of main board control chip	24*0.03=0.72W
	Valid full input of optical coupling	24*0.13=3.12W
	Button light	14*24*0.03

10.1.3.2 Working environment:

Environment	Condition
Temperature	-10°C ~ +60°C
Humidity	<80%
Soil fog	Soil fog content: 0.13ug/m^3
Impact	Peak acceleration speed: 100gn; 100 times
Vibration	10Hz-100Hz: 50 times ; 100Hz-10Hz 50 times
Momentary pulse group interference	2000V

10.1.4 Definition of the input/output interface

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
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 switch
14	J17	RDOL	Rear Door Open limit
15	J18	RDCL	Rear Door Close limit

No.	Pin	Terminal code	Terminal definition
16	J19	FRCL	Fire close limit
17	J23	26 pins	Extension interface of command board
18	J24	DJ1, V+, AJ1, V-	1st floor internal command
19	J25	DJ2, V+, AJ2, V-	2nd floor internal command
20	J26	DJ3, V+, AJ3, V-	3rd floor internal command
21	J27	DJ4, V+, AJ4, V-	4th floor internal command
22	J28	DJ5, V+, AJ5, V-	5th floor internal command
23	J29	DJ6, V+, AJ6, V-	6th floor internal command
24	J30	DJ7, V+, AJ7, V-	7th floor internal command
25	J31	DJ8, V+, AJ8, V-	8th floor internal command
26	J32	DJ9, V+, AJ9, V-	9th floor internal command
27	J33	DJ10, V+, AJ10, V-	10th floor internal command
28	J34	DJ11, V+, AJ11, V-	11th floor internal command
29	J35	DJ12, V+, AJ12, V-	12th floor internal 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, BK2, COM3	CHM—Chime KLS—Light Saving Arrival gong, lighting control
32	J1	CANH, CANL, 24V-, 24V+	Serial communication interface

10.1.5 Connection method

10.1.5.1 Car controller and connection between power supply and communication bus

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

Item	Requirement or remark
Usage	J1 is the serial communication interface connecting the engine room and the floor display controller
Connector type	VH-4 connector

Item	Requirement or remark
Interface definition	4 pin: 24+; 3 pin: 24-; 2 pin: CANL; 1 pin: CANH
Connection wire requirement	Must be 4-core twisted pairs, in which 24+ and 24- form a group of pair; CANH and CANL form a group of pair

The detailed connection:

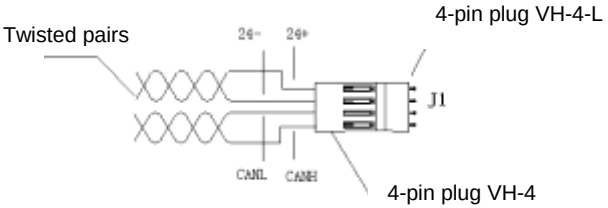


Figure 10-2 connection of the car main controller DC-01

10.1.5.2 Connection of the input signal of the car controller

Car controller mainly collects part of the digital signals from the top, internal and bottom of the car and sends these signals to main controller by CAN bus. These signals include open/close input, open/closed, safety edge, attendant, direct drive, overload and full load.

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 CAN bus, in which the relay output controls arrival gong relay and light relay so as to control arrival forecast and energy-saving lighting function. The output of the transistor controls output of the close/open button light.

10.1.5.4 Connection of door button and indicator

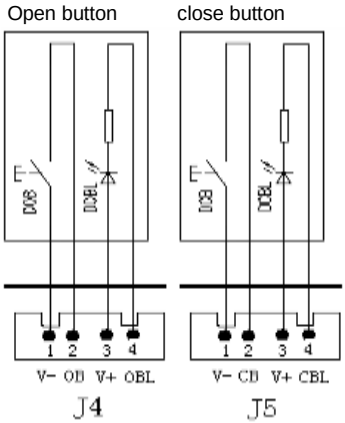


Figure 10-3 Connection of door button and indicator

10.1.6 Settings of configuration

No.	Configuration of Door operator and control cabinet	2-core J2 pin nearing installation hole	RDO, RDC
1	Single control cabinet and single door operator	No short-circuit	When F0.09=0, F0.15=11, RDO and RDC can be the light of open delay button
2	Single control cabinet and dual door operator	No short-circuit	When F0.09=1, RDO and RDC can be the open/close output of rear door
3	Dual control cabinet and single door operator	No short-circuit	When F0.09=0, F0.15 can defines RDO and RDC. By parallel connection, the buttons and lights of two control cabinets can be handled in the same way.
4	Dual control cabinet and dual door operator	Rear door board needs to be short-circuited	When F0.09=0, the set value of F0.15 corresponds to the output port of RDO and RDC. DO and DC of rear door board act as open/close output of rear door, the corresponding in-position signals are DOL and DCL of rear door board, SE of rear door board act as rear door edge.

10.2 DC-02 command extension board

10.2.1 Overall instruction of DC-02

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

10.2.2 DC-02 interface instruction

10.2.2.1 Installation dimension

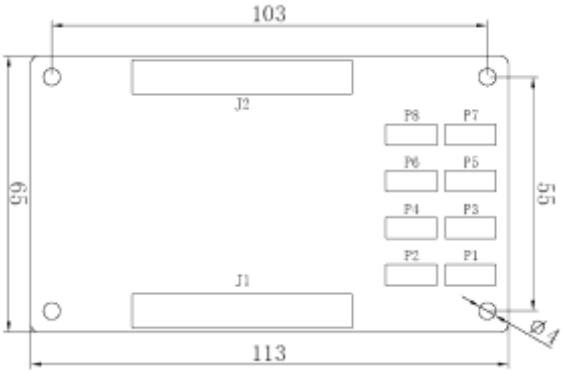


Figure 10-4 Installation size of the DC-02 command extension board

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.

No.	Code	Name	Remark
1~8	P1~P8	Internal calling signal input and registration instruction output terminal	XH-4 terminal
9	J1	Input connector of internal command control bus	DC3-26PIN connector
10	J2	Output connector of internal 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 24V power	④	Negative pole of the 24V power

P1~P8 of the first I/O controller correspond to the command registration and indication of 13~20 floor; P1~P8 of the second controller correspond to the command registration and indication of 21~28 floor; based on this analogy, 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

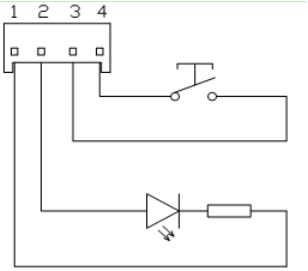


Figure 10-5 Connection of P1-P8 command button wires

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

10.2.3.2 Connection method of P9 and P10

P9 is the connection port of car controller. If the floor is high, the command board needs to be expanded, then P9 of the sub-command board is connected with P10 of the upper command and so on.

10.3 Calling display 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 display board in the car.

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

10.3.1 Installation dimension of DC-03A

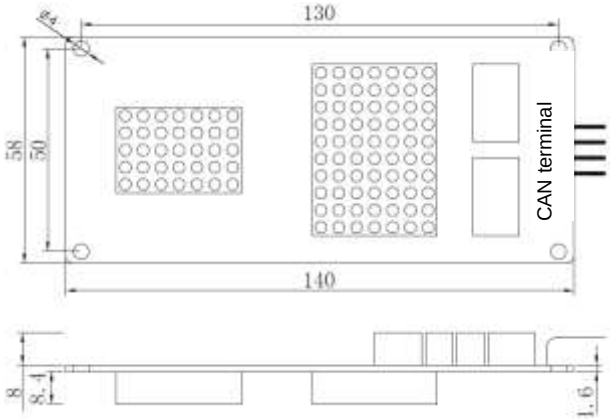


Figure 10-6 Installation dimension of DC-03A

	◆ The floor address of the lobby calling board cannot be set to 0. ◆ It is recommended to use shielded communication cables to avoid interference. ◆ Strictly following the terminal symbols during connection and ensure the connection is firm enough.

10.3.2 Parts instruction of calling display board DC-03A

No.	Code	Terminal Definition	Instruction
1	P1	CANH, CANL, 24-, 24+	Power input and communication bus interface
2	P2	LU, V+, UP, V-	Up calling button and registration indicator
3	P3	LD, V+, UP, V-	Down calling button and registration indicator
4	P4	XF, V-	Fire signal
5	P5	LK, V-	Lock signal
6	D3	Running communication indicator	Off during normal communication Flickering when no communication
7	P6	Program download port	
8	P7	Spare function port	Direction forecast and arrival gong forecast function
9	J3	Crossover terminal of the communication terminal resistor	Short circuit the corresponding J3 terminal of the bottom floor lobby display board and car display board
10	J5	Crossover terminal of parameter setting	Short circuit : setting state Off: running state

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

Function of arrival gong: T2 will ring once for 1s at up arrival; T2 will ring twice for 1s at the interval of 0.5s at down arrival;

Function of forecast light: During upward running, T0 will flicker at the interval of 0.5s and stop when the door closes; during downward running, T1 will flicker at the interval of 1s and stop when the door closes;

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

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

10.3.3.1 P1 electrical interface of the calling display board DC-03A

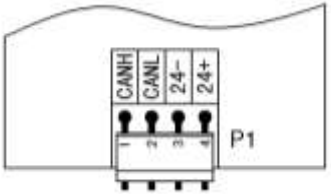


Figure 10-7 P1 electrical interface of DC-03A (terminal model: VH-4)

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

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

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

10.3.4.1 Electrical connection of the calling display board DC-03A:

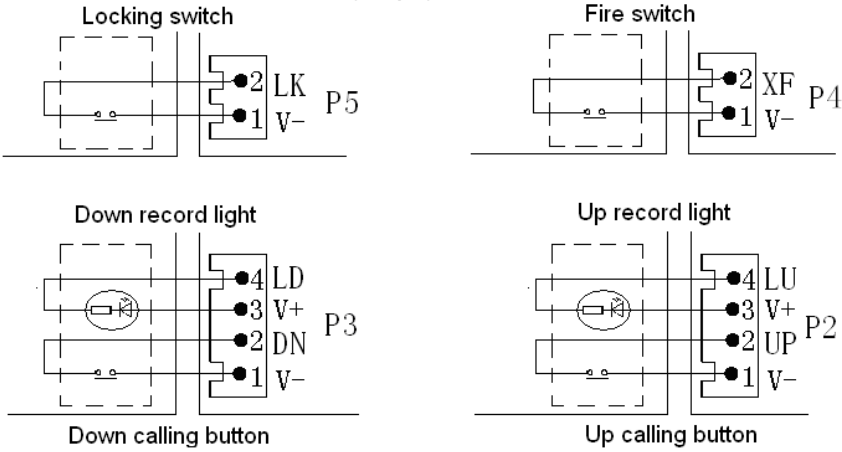


Figure 10-8 Electrical connection of calling display board (terminal model of P2 and P3: XH-4; terminal model of P4 and P5: XH-2)

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

10.3.5.1 Button digital input

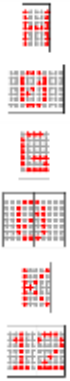
Input type		Optical isolation Open circuit input
Current signal	“0” electrical level	0~2mA
	“1” electrical level	4.5~8mA
Voltage signal	“0” electrical level	18~24V DC
	“1” electrical level	0~5V DC
Signal digital filter delay		20mS
Signal response frequency		500Hz

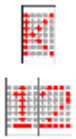
10.3.5.2 Indicator output

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 setting state		“K” is the code of the set address parameter “12” is the set address
⑵:UP button of jogging calling: the value of set parameter increases; DOWN button of jogging calling: the value of set parameter is decreases		After parameter modification, remove the short circuit tag and the parameter will save automatically.
⑶:jogging P5 or P4, the set parameters codes change in turns: cyclic switching between H→G→K		H：function selection G：spare function K：address of display board

Operation steps	Lattice displaying	Instruction
(4): Unplug J5 (SET) to run normally, and the setting is done.		Normal running display

10.3.6.2 Parameters setting of the calling display 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 lobby display board

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

When the independent button control of the rear and front door is applied, the address of DC-03A board starts from K=33 and so on, the maximum address cannot exceed 64.

10.3.6.4 Address setting of the display board in the car

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

10.3.7 Function setting of the calling display board

10.3.7.1 Definition of 'H'

'H' is a hex data composing of 8 binaries. During setting, 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:

Value (X represent any value: 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 1th position is "1"
X	X	X	X	X	1	X	X	Arrow enabling, the arrow displays the state when the 2nd position is "1"
X	X	X	X	1	X	X	X	Inspection displaying enabling, the inspection state displays JX when the 3rd position is "1"
X	X	X	1	X	X	X	X	Rear door lobby calling enabling, when the 4th position is "1", it indicates rear door board
1	X	X	X	X	X	X	X	Fire lobby calling display selection, when 7th position is "1", there is no displaying for the fire down lobby calling

10.3.7.2 Lock enabling setting

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

10.3.7.3 Fire enabling setting

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

Note: For the lobby calling controller of the whole elevator, only one lock enabling and fire enabling can be valid, the lock enabling and fire enabling can be set on different lobby calling controller.

10.3.7.4 Thin arrow enabling setting

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

10.3.8 Displaying table of elevator state

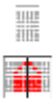
Displaying in the car				
Station prediction: no				
Inspection	☑ normal displaying	☐ abnormal displaying	☐special characters or other mode	Display floor number and leveling mark when inspection in leveling; Display floor number when inspection not in leveling
Power off Leveling	☑ normal displaying	☐ 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 lobby				
Station prediction: no				
Inspection	☐ normal displaying	☐ no displaying	☑ special characters or other mode	

Displaying outside the lobby				
Station prediction: no				
Power off Leveling	☑ normal displaying	☐ no displaying	☑ special characters or other mode	
Independent	☐ normal displaying	☑ no displaying	☐ special characters or other mode	1[F], 2/3 in normal display
Fire	☑ normal displaying	☐ no displaying	☐ special characters or other mode	Optional
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 in normal display
Full load	☐ normal displaying	☐ no displaying	☑ special characters or other mode	1[F],2/3 in normal display

10.3.9 Displaying pictures

No.	Picture	Meaning
1		Displaying content in the car under inspection "=" means the elevator is in the leveling position of 12th floor
2		Lobby displaying content which means inspection state  (Note: When the third bit of H=1, inspection state will be displayed)
3		Lobby displaying, in which "F" means the elevator is in full-load running
4		Display in the car, "OL" means overload
5		If the arrow does not roll, it means the elevator is about to go up. Rolling arrow means the elevator is going up. The quicker the rolling speed is, the faster the elevator is running.
6		If the arrow does not roll, it means the elevator is about 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 display is in floor setting state.
8		The display is in multi-function displaying state.
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 display board, power supply and communication bus

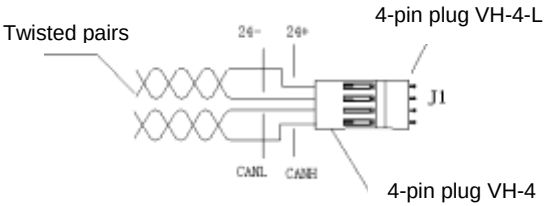


Figure 10-9 connection method

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

10.3.10.2 Installation requirement

- Please install non-combustible material eg metal, 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 environment with water drops, otherwise damage may occur to the controller.
- Do not drop any metal objects eg screws, pads or metal 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

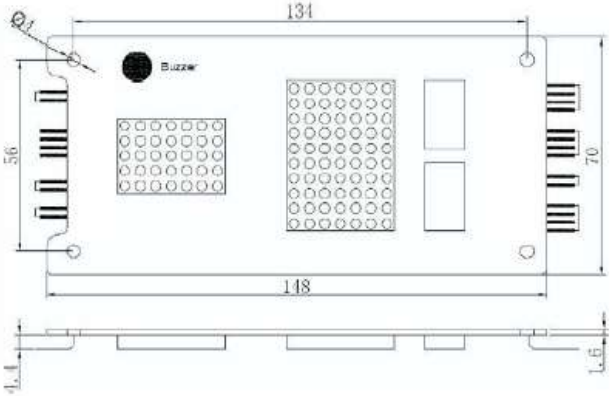


Figure 10-10 Installation dimension of DC-03B

	◆ The floor address of lobby calling board cannot be set to 0. ◆ It is recommended to use shielded twisted pairs for communication connection to avoid interference. ◆ Strictly following the terminal symbol during connection and ensure the connection is firm enough. ◆ The function of DC-03B is the same as that of DC-03A except the “bee alarm”. The wiring difference lies in that the connectors adopt 2510R-4P (2.54mm) and 2510R-42(2.54mm).

10.4.2 Definition of ‘H’

‘H’ is a hex data composing of 8 binaries. During setting, 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:

Value (X represents any value: 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 acts when the 0 position is “1”
X	X	X	X	X	X	1	X	Fire enabling, fire signal acts when the 1th position is “1”
X	X	X	X	X	1	X	X	Thin arrow enabling, the thin arrow displays the state when the 2nd position is “1”
X	X	X	X	1	X	X	X	Inspection displaying mode enabling, the inspection state displays JX when the 3rd position is “1”
X	X	X	1	X	X	X	X	Buzzer prompt enabling, the buzzer prompt acts when the 4th position is “1”

Note: When H=10, the buzzer prompt is enabled. In up registration, the buzzer prompts once and in down registration, it prompts twice.

10.5 Instruction of DC-07B

DC-07A/B is the segment vertical LCD. Inside/outside protocol can be realized by parameter setting.

10.5.1 Installation dimension of DC-07B

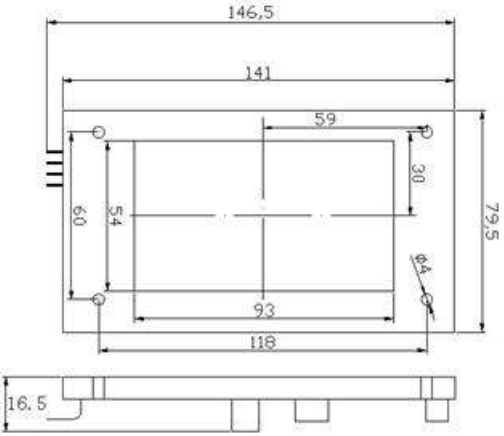


Figure 10-11 Installation dimension of DC-07B

Model	Dimension	Installation dimension	Diameter of installation bore	Thickness
DC-07B	146.5×79.5 (mm)	118×60 (mm)	Φ4 (mm)	16.5 (mm)

10.5.2 Terminal instruction of DC-07B

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 registration light
3	P3	L1, V+, DN, V-	XH-4	Down calling button and registration 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 crossover terminal for parameters setting (short circuit SET/GND for setting, short circuit RUN/GND to save the setting)
7	P7	V+, T0, T1, T2, V-	XH-5	Preserved port for arrival gong light
8	J1	CAN	Single pin 1*2	Crossover terminal of communication terminal resistor

10.5.3 Instruction of DC-07B communication interface

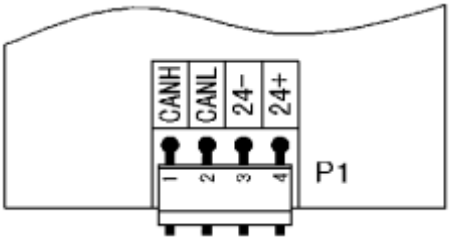


Figure 10-12 P1 electrical interface of DC-07B (terminal model: VH-4)

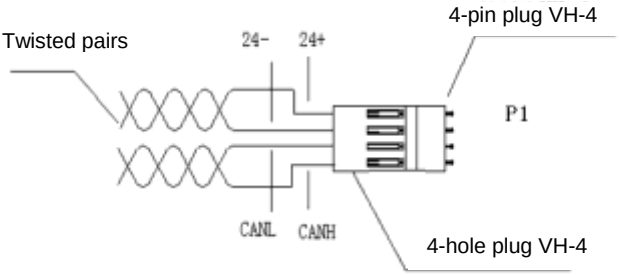


Figure 10-13 Connection between calling display board, power and communication bus

The power and communication of the display board is brought in by 4-hole plug, in which 4 pin is 24+, 3 pin is 24-, input power is DC24V, 2 pin is CANL and 1 pin is CANH. The communication wires should be twisted pairs

10.5.4 Function of DC-07B communication bus P1

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

10.5.5 P2~P5 terminal instruction of DC-07B

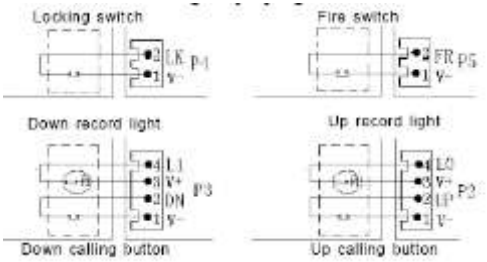


Figure 10-14 Electrical connection of the calling display board communication bus

(terminal model of P2 and P3: XH-4; terminal model of P4 and P5: XH-2)

10.5.6 P2~P5 terminal function of DC-07B

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

10.5.7 Electrical specification of P2~P5 terminals

Button digital 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 response frequency		500Hz

Indicator output

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

10.5.8 Instruction of multi-function J6 terminal

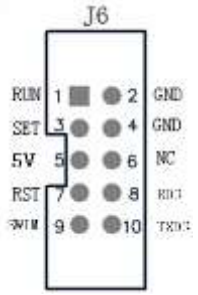


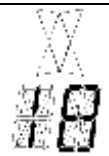
Figure 10-15 Diagram of multi-function terminal J6

10.5.9 Definition of multi-function P6 terminal

Code	Definition
①②	Short circuit two terminals and enter normal displaying state (precondition: enter the setting state)
③④	Short circuit two terminals for 2s and enter the setting state

⑤	MF output power 5V terminal
②④	MF output power 0V terminal
⑦	Reset terminal
Other	Not connected

10.5.10 Parameters setting of DC-07B

Operation steps	LED displaying	Instruction
⑴:Short circuit ③④ terminals of P6 for 2s and enter setting state		K1 represents the office number
⑵:in menu bar state: jogging UP and V- of lobby calling UP button P2, the menu bar increases automatically; jogging DN and V- of lobby calling DOWN button P3, the menu bar decreases automatically		K1-K9 represent certain individual function
⑶:in a certain menu bar, short circuit LK and V- of lock button P4 and enter the setting state; the parameter is flickering simultaneously		0 represents the parameters under this menu
⑷:in parameter setting state, jogging UP and V- of lobby calling UP button P2, the parameter increases automatically; jogging DN and V- of lobby calling DOWN button P3, the parameter decreases automatically		The parameter value after modification
⑸:after parameter setting is done, short circuit FR and V- of P5 and exit from parameter setting		Display current menu
⑹: short circuit ①② terminals of P6, then exit and save the setting. If the parameter saving is correct, display OK.		OK indicates successful setting

Operation steps	LED displaying	Instruction
(7):if the parameter saving is wrong, displays Er		Er means error, namely the setting is faulty
(8):if the parameter is not changed, display NC		NC means not changed, namely the parameter does not change
(9): reset to run normally, and the setting is done.		Normal running displaying

10.5.11 DC-07B parameter table

Code	Value	Instruction
K1	XX	Corresponding to the actual floor number; the bottom floor is 1 and the maximum value cannot exceed 64
	0	Display board in the car
K2	0	Lock elevator is not enabled
	1	Lock elevator is enabled. Please enable one piece of lobby calling board on the same elevator to act as lock.
K3	0	Fire is not enabled
	1	Fire is enabled. Please enable one piece of lobby calling board on the same elevator to act as fire safety.
K4	0	In running, the arrow flickers
	1	In running, the arrow does not flicker
K5	0	In fire state, lobby calling board displays normally and showing character “fire”
	1	In fire state, lobby calling board display is blocked
K6	0	In inspection state, lobby calling board display is blocked, after pressing the button, it displays current floor and inspection
	1	In inspection state, lobby calling board display is normal and displays current floor and inspection
K7	0	Lock switch logic is NO, breakover means action

Code	Value	Instruction
	1	Lock switch logic is NO, disconnection means action
K8	0	Fire switch logic is NO, breakover means action
	1	Fire switch logic is NC, disconnection means action
K9	0	”Inspection” “Fire” ”Overload” “Full load” in Chinese
	1	The state displays English mode
KA	bit0:01H	When it is set to x1, number clearance of rear door in current floor is enabled, default value=0, non-enable.
	bit1:02H	When it is set to x2, energy-saving is canceled, the default value=0, energy-saving is valid
	bit2:04H	When it is set to x4, select open protocol, default value=0, adopt internal protocol
	bit7:80H	Read only bit, 8xH means the clock adopts external crystal oscillation, and 0xH means internal oscillation.
	Setting instruction	The working state parameter of crystal oscillation is unchangeable, if it is necessary to set KA function parameter, modify the ones, eg: In external crystal oscillation state, if it is necessary to enable rear door number clearance of current floor and cancel energy-saving, set to 83; In internal crystal oscillation state, if it is necessary to set as open protocol and cancel energy-saving, set to 06.

10.5.12 Address setting of lobby display board DC-07B

If DC-07B is lobby calling display board, set ‘K1’ to correspond to physical floors, namely the K1 value of the bottom floor is 1 (when setting the rear door, K1 value should be added with 32 based on the physical floor) and the maximum cannot exceed 64.

Note: The crossover terminal of J1 communication terminal resistor, which correspond to the bottom floor lobby calling display board and car display board, should be short circuited.

10.5.13 Address setting of the display board DC-07B in the car

If DC-07B is the display board in the car, set the address ‘K1’ to 0.

10.5.14 DC-07B Lock enabling setting

Set lock enabling ‘K2’to ‘1’, the elevator is running automatically and when the lock signal closes, the floor displaying outside the elevator is off. At lobby calling, the lobby calling board displays “LK” and “Inspection” while displaying in the car is normal. When the elevator returns to the stopping floor and the door is closed, the elevator enters lock state.

10.5.15 DC-07B Fire enabling setting forecast

Set the fire safety enabling “K3” to ‘1’. When the elevator is running and the fire signal closes, the elevator will be in the fire running state.

	◆ For the lobby calling controller of the whole elevator, only one lock enabling and fire enabling can be valid, the lock enabling and fire enabling can be set on different lobby calling controllers.

10.5.16 DC-07B direction

Lobby arrival gong function: (T2/24V+output) The arrival gong T2 rings once for 1s at up arrival and rings twice for 1s at each time (there is a 0.5s interval between two times of ringing) for down arrival.

Forecast light for lobby arrival: (T0/24V+ output) T0 will flicker at 0.5s interval at up running forecast until door close; (T1/24V+ output) T1 will flicker at 1s interval at down running forecast until door close.

Lobby opening forecast function: When the elevator is in standby, during lobby up calling, T0 will flicker at 0.5s until door close and during lobby down calling, T1 will flicker at 1s interval until door close.

10.5.17 Safety precautions of DC-07B installation

- Mount the device on nonflammable material eg metal, otherwise fire may occur.
- Do not place flammable material nearby, otherwise fire may occur.
- Do not install in environment that contains explosive gases, otherwise fire may occur.
- Do not remove the protective bottom plate (if any) on each part, otherwise accidental damage to the parts may occur.
- Do not pose the cover and panel under stress, otherwise damage to the controller may occur.
- The installation position should be free of dripping water or other liquids, otherwise damage to the controller may occur.
- Make sure no screws, washers or other metal object fall and stick on the display board, otherwise damage to the controller may occur.

	◆ The floor address of the lobby calling board cannot be set to 0. ◆ It is recommended to use shielded twisted pairs to avoid interference. ◆ Strictly following terminal symbols during connection and ensure the connection is firm enough.

10.6 Instruction of DC-07H

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

10.6.1 Installation dimension of DC-07H

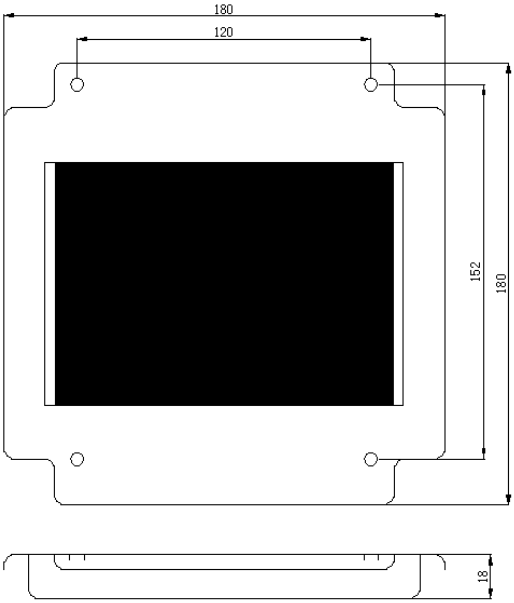


Figure 10-17 Installation dimension of DC-07H

	◆ The floor address of the lobby calling board cannot be set to 0. ◆ It is recommended to use shielded twisted pairs to avoid interference. ◆ Strictly following terminal symbols during connection and ensure the connection is firm enough.

10.6.2 Parts instruction of DC-07H

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 registration indicator
3	JP4	2(L1), 2(V+), 3(DN), 4(V-)	2510R-4P	Down calling button and registration indicator
4	JP5	1(NC), 2(NC), 3(LK),4(V-)	2510R-4P	Lock signal
5	SW1	The dial switch has 2 buttons. Switch No.1 button is the ON button for entering function parameter menu. Switch No.2 button acts as CAN communication terminal resistor, toggling the switch to KE position makes terminal resistor.		

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 K1 options. Jogging 3 and 4 of JP3, K1 turns forward (K1/K2/K3/K4/K5); Jogging 3 and 4 of JP4, K1 turns backward (K1/K5/K4/K3/K2/K1). After menu code selection, Jogging 3 and 4 of JP5, then enter 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 then entering 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 the car
K2	0	Lock elevator is not enabled and the signal input is invalid
	1	Lock elevator is enabled and the signal input is valid
K3	0	K3=0, the arrow flickers during running
	1	K3=1, the arrow does not flicker
K4	0	K4=0, lock point is NO
	1	K4=1, lock point is NC
K5	0	K5=0, “Overload” “Leave” in Chinese
	1	K5=1, the state displays in English

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 with EC100 and the display board in the car, and it supports RS232 communication with upper computer. It is an important transfer station for the signal collection and control signal output of EC100 controller.

10.7.1 Installation dimension

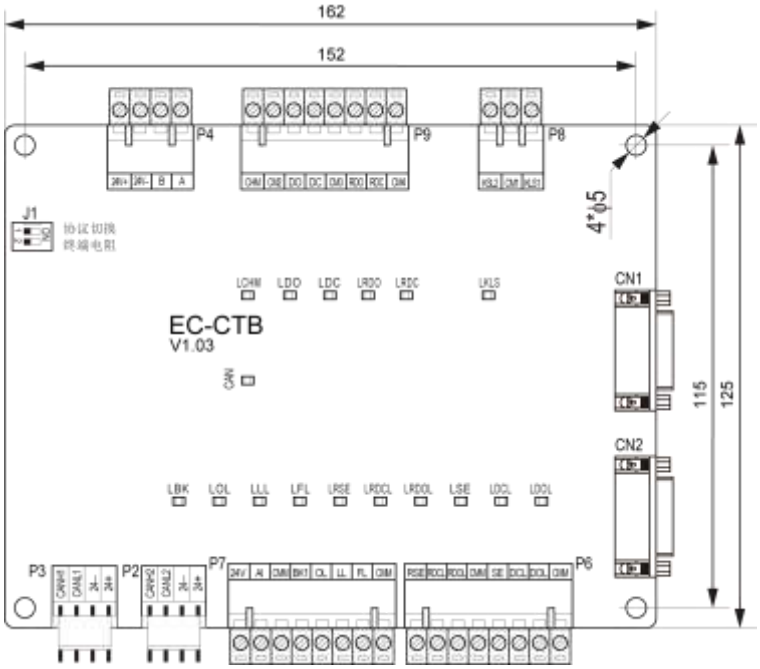


Figure 10-18 Installation dimension of car top board

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 I/O Interface definition

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

No.	Pin	Interface	Definition
		DOL, CMM	
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 point; OL is the overload input point; LL is the light load input point and FL is the full load input point
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

No.	DIP	Function description
J1	1	Switch to “ON” when use external protocol. Default setting: “OFF”
	2	Switch to “ON” and the CAN terminal resistor is valid. Default setting: “OFF”.

- It is recommended to use shielded twisted cables for the avoidance of interference. Avoid parallel cable routine.
- Use 9-core cable to connect the car top board and command board.(pin 1-1, 2-2, 3-3, 4-4, 5-5, 6-6, 7-7, 8-8, 9-9)
- It is better to use shielded cables as the communication wires.
- Strictly following terminal symbols during connection and ensure the connection is firm enough.

10.7.4 Settings of configuration

No.	Door operator and control cabinet configuration	BK1 terminal	DOD and PAS light (F0.09=0)
1	Single control cabinet and single door operator	Not connect by default	When F0.15=11, DOD and PAS can act as opening delay button light
2	Single control cabinet and dual door operator	Not connect by default	When F0.15=1, DOD acts as rear door opening indicator. Connect 4 pins of J19-DOD to 4 pins of J17, and PAS acts as opening delay button light

No.	Door operator and control cabinet configuration	BK1 terminal	DOD and PAS light (F0.09=0)
3	Dual control cabinet and single door operator	Short circuit CMM	The buttons and lights of two control cabinets can be handled in the same way.
4	Dual control cabinet and dual door operator	Not connect by default	DOD and PAS of front door control cabinet can act as multi-function output.

10.8 Instruction of EC-CCB

EC-CCB is the supporting command board for EC-CTB in EC100 controller. Each command board has 24 input and 22 output interfaces, including 16 floor buttons and 8 function signals. It is mainly used for the button command collection and button light output. Operation needs of 64 floors can be met by cascading connection mode and operation needs of the main/vice control cabinets of the car can be realized by parallel connection.

10.8.1 Installation dimension

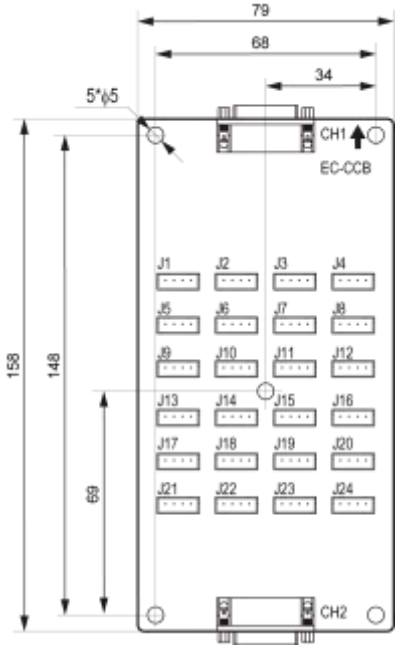


Figure 10-19 Installation dimension

10.8.2 I/O Interface definition

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 (refer to fig 10-20 for connection mode)	
4	J2	V+,K, V+,L-	Button input of floor 2	
5	J3	V+,K, V+,L-	Button input of floor 3	For command board 2, Jn input signal corresponds to the input of (16+n) button, namely the 2nd board can expands 20 floor commands
6	J4	V+,K, V+,L-	Button input of floor 4	
7	J5	V+,K, V+,L-	Button input of floor 5	
8	J6	V+,K, V+,L-	Button input of floor 6	
9	J7	V+,K, V+,L-	Button input of floor 7	
10	J8	V+,K, V+,L-	Button input of floor 8	
11	J9	V+,K, V+,L-	Button input of floor 9	
12	J10	V+,K, V+,L-	Button input of floor 10	
13	J11	V+,K, V+,L-	Button input of floor 11	
14	J12	V+,K, V+,L-	Button input of floor 12	
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 (refer to fig. 10-21 for connection mode)	
5	J18/CBL	V+,K, V+,L-	Button input of door close (refer to fig. 10-22 for connection mode)	
6	J19/DOD	V+,K, V+,L-	Button input of door open delay	
7	J20/PAS	V+,K, V+,L-	Button input of direct drive	
8	J21/ATT	V+,K, null, null	Button input of attendant	Invalid for command board 2
9	J22/DS	V+,K, null, null	Button input of direction change	
10	J23/IND	V+,K, null, null	Button of separate running	
11	J24/FRCL	V+,K, null, null	Door close input of fire fighter button	

- It is recommended to use shielded twisted pairs for the avoidance of interference. Avoid parallel cable routine.
- Use 9-core cables to connect the car board and command board (pin 1-1, 2-2, 3-3, 4-4, 5-5, 6-6, 7-7, 8-8, 9-9).
- Strictly following terminal symbols during connection and ensure the connection is firm enough.

10.8.3 Car command button and connection of the indicators

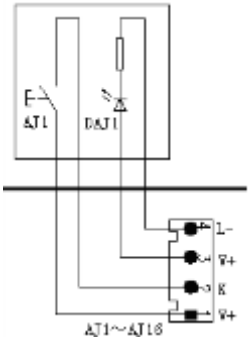


Figure 10-20 Car command button and connection of the indicators

10.8.4 Car open button and connection of the indicators

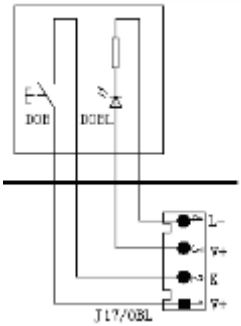


Figure 10-21 Car open button and connection of the indicators

10.8.5 Car close button and connection of the indicators

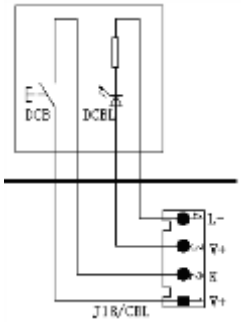


Figure 10-22 Car close button and connection of the indicators

10.9 Instruction of MC-GCL

The group control board MC-GCL and elevator intelligent integration EC100 make up the distributed

control system DCS. The group control board collects internal/lobby calling registration signals of each elevator in real time by CAN communication. After intelligent processing, it allocates the information to corresponding elevator, thus realizing a group control schedule covering up to 8 elevators within 64 floors to ensure highly efficient elevator running. DCS group control schedule is equipped with the following functions:

1. Self-adaptive to up running in rush hour: when the group control board identifies up running rush hours, all elevators will provide calling service according to up calling priority. After rush hours, it changes to balanced mode automatically.

2. Self-adaptive to down running in rush hour: when the group control board identifies down running 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, it changes to balanced mode automatically.

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

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

5. Timed zoning running: in the set time, the selected elevators will only stop at allocated floors and prompt passengers by sound and light according to setting, thus achieving highly efficient running by running as fast as possible while stop as less as possible.

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

7. Idle 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 as well as highly intelligent and reliable design. It also has the manual keypad for operation and LCD interface for debugging.

10.9.1 Installation dimension

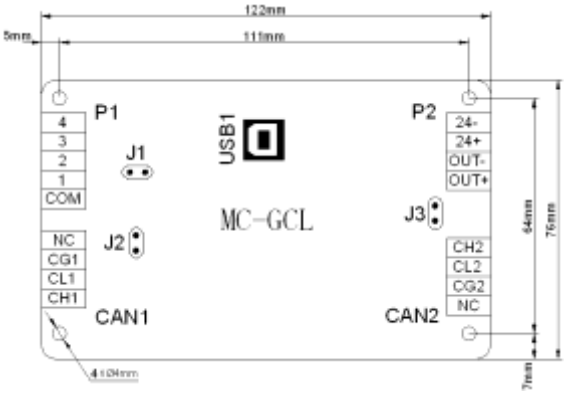


Figure 10-23 Installation dimension

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 running	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 type USB female socket

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:

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

10.9.4.3 Low-voltage switch specifications:

Input point	4 channel	
Input mode	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 terminal:

Terminal	Mode	Function
CAN1	CAN BUS	Define group control terminal communication 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
Impact	Peak acceleration speed 100gn, 100 times
Vibration	10Hz-100Hz 50 times 100Hz-10Hz 50 times
Momentary pulse group interference	2.5KV

10.9.5 Definition of the input/output interface

10.9.5.1 Definition of power supply terminal

P2 terminal is for providing working power terminal for MC-GCL group control board and is supplied by external DC24V switch power.

No.	Pin	I/O	Definition	Remark
P2	24-	Input	DC0V input terminal	
	24+	Input	DC24V+ input terminal	
	OUT-	Output	Provide DC0V power terminal for external	
	OUT+	Output	Provide DC24V+ power terminal for external	

10.9.5.2 Definition of CAN communication interface

CAN1 and CAN2 are CAN communication terminals and communication cables must be twisted pairs.

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 module	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 module	Not grounded generally
	NC	Output	Not connected	

10.9.5.3 Definition of I/O terminal

No.	Pin	I/O	Definition	Corresponding LED
P1	COM	Input	1, 2, 3 and 4 pins input common terminals	—
	1	Input	Undefined	L4
	2	Input	Undefined	L3
	3	Input	Undefined	L2
	4	Input	Undefined	L1

10.9.6 Jumper terminal definition

No.	Definition of pin	Remark
J1	Short circuit the connector in serial download software mode	Not short circuited by default
J2	Short circuit pin between group control board and CAN communication terminal resistor defined on EC100-I/O board; during short circuit, resistance of communication terminal resistor is about 120Ω, if not short circuited, communication terminal resistor is open circuit	short circuited by default
J3	Short circuit pin between group control board and CAN communication terminal resistor; during short circuit, resistance of communication terminal resistor is about 120Ω, if not short circuited, the resistor is open circuit	Short circuited by default; during on site application, for the two group control boards at the farthest end, their J3 need to be short circuited while for other J3, it is unnecessary to do so.

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).

Name	Instruction
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, but LED3-8 is off, please check:

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

2. Whether the number of group control boards is more than 8 (combined with manual operator, by menu: system monitoring-calling and running state interface-L:ABCDEFGH monitoring, note: ABCDEFGH represents 1~8 elevators in order).

10.9.8 Diagram of communication terminal

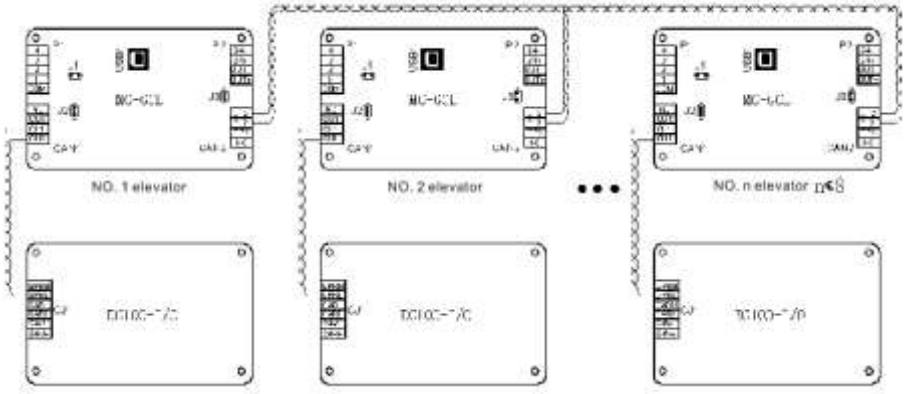


Figure 10-24 Diagram of GCL CAN communication connection

Precautions for wiring and debugging of MC-GCL group control board:

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 of MC-GCL

10.9.9.1 Connection between MC-GCL and manual operator

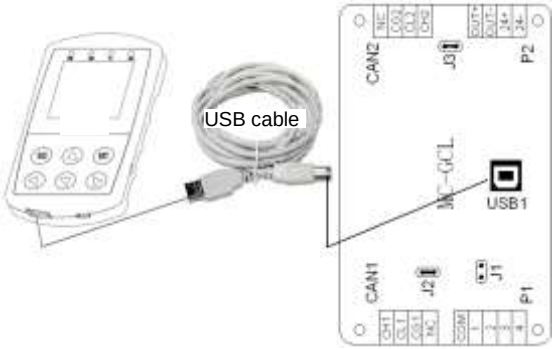
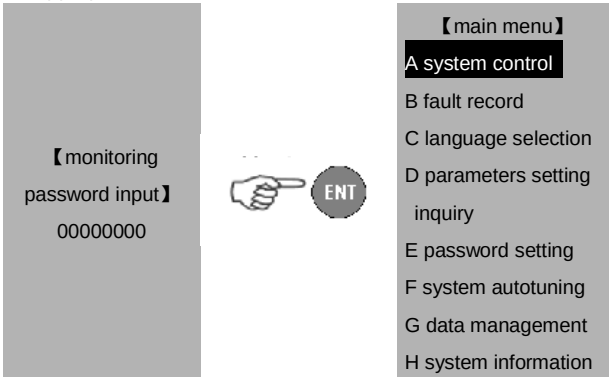


Figure 10-25 Connection of manual operator and MC-GCL

10.9.9.2 Initial debugging interface



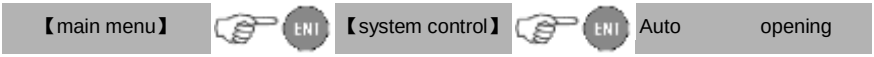
The monitoring password can only enter A, B and H in the main menu and they are read only.

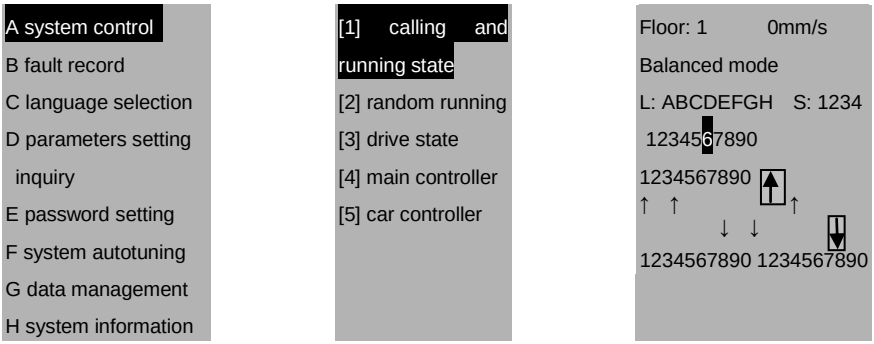
After inputting the monitoring password, pressing ESC can shift into the password debugging or factory password input mode.

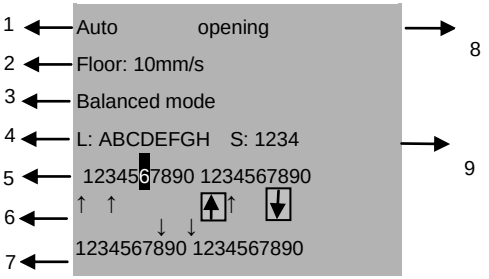
The original value of monitoring password and debugging password is 00000000.

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







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	Monitoring registered car command
6	Stands for the registered lobby up calling command (the arrow box means assigning the up command of the elevator)
7	Stands for the registered lobby 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 to D after entering the main menu and press ENT to enter parameters setting; the main menu is as below:

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

inquiry】
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】
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

【P0 system clock 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 layout of home landing

【main menu】
A system control
B fault record
C language selection
D parameters setting inquiry
E password setting

【parameters setting inquiry】
P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

【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

F system autotuning G data management H system information		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】	Bottom floor by default
Standby floor in up running during rush hour; separate standby—elevator A returns to standby floor (P2_03=0, the function is invalid)			
P1_01	Home landing in middle	00~64【00】	Middle floor by auto. calculation
Separate standby—elevator B returns to standby floor (P2_03=0, the function is invalid)			
P1_02	Home landing at top	00~64【64】	Top floor by default
Standby floor in down during rush hour; 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		【parameters setting inquiry】 P0 system clock

【P2 time setting】
00 idle time threshold
01 time threshold of

C language selection
D parameters setting inquiry
E password setting
F system autotuning
G data management
H system information

setting
P1 floor of home landing
P2 time setting
P3 running mode setting

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 from 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 (the corresponding standby floor is not set to 0)			
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

【parameters setting inquiry】
P0 system clock setting
P1 floor of home landing
P2 time setting
P3 running mode setting

【P3 running mode setting】
00 timed 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 identification of rush hour
07 running time of auto rush hour

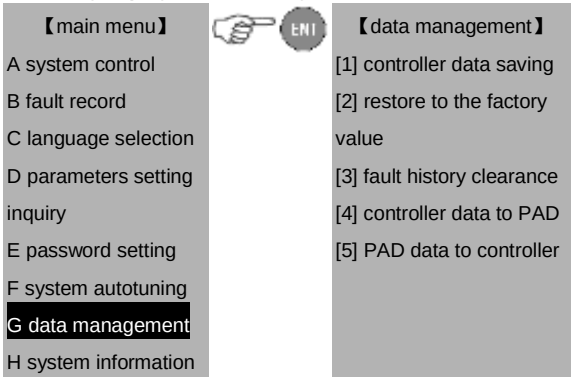
F system autotuning G data management H system information		08 reserved 09 zoning mode 1 enabling 10 zoning mode 1 start time 11 zoning mode 1 end time 12 mode 1 floor setting -16 13 mode 1 floor setting -32 14 mode 1 floor setting -48 15 mode 1 floor setting -64 16 zoning mode 2 enabling 17 zoning mode 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	Timed 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】	

Function code	Description	Setting range【default value】	Remark
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 identification of rush hour	0~9【2】	
P3_07	Running time of timed 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	

Function code	Description	Setting range【default value】	Remark
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



[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]Save the controller data to PAD.

[4] Download PAD data to the controller. Note: For data saving at power off, enter “controller data saving” menu and carry out corresponding operations.

10.9.10 Precautions for separate standby of bias floors

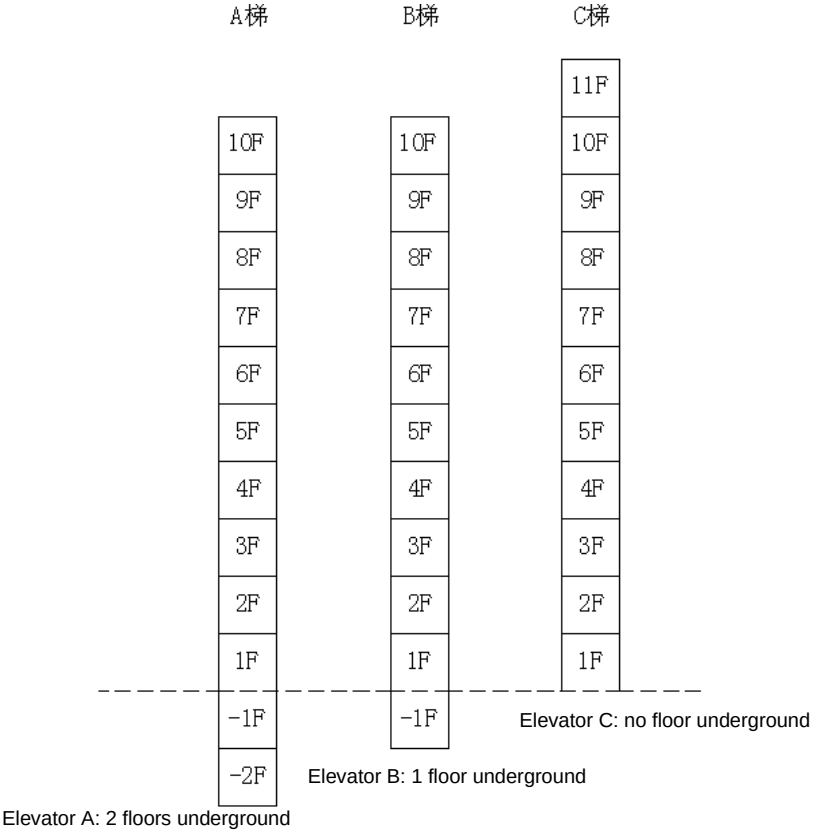


Figure 10-26 Bias floor distribution

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 automatically 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

When 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(set according to the actual floor number); P2-03(time threshold of separate standby) ≠0 valid;

Elevator B: P1-00(down home landing) =06(set according to the actual floor number); P2-03(time threshold of separate standby) ≠0 valid;

Elevator C: P1-00(down home landing)=10(set according to the actual floor number); P2-03(time threshold of separate standby)≠0 valid;

10.10 Instruction of EC-RDB

EC-RDB adopts four safety relays with highly reliable design and has passed the certification of the elevator safety circuit test.

10.10.1 Installation dimension

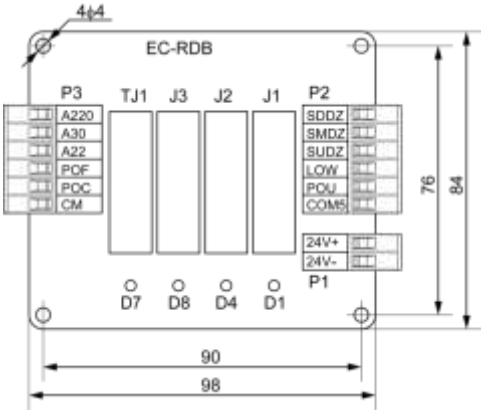


Figure 10-27 Installation dimension of EC-RDB

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	Advance door opening/creeping leveling/synchronous motor UCMP detection	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 PCB board

Name	EC-RDB
Color	Green
Thickness	1.6mm
Layers of layout	2

10.10.4.2 Specification of the power supply

Standard input voltage range	DC22V~DC26V

10.10.4.3 Working environment

Temperature	0 °C ~ 70 °C
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 terminal

P2 terminal is for providing working power terminal for MC-GCL group control board and is supplied by external DC24V switch power.

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: input detection signal

P3: output signal of short circuit lock circuit

No.	Pin	Terminal code	Terminal definition	Remark
P2	1	SDDZ	Lower door area signal	
	2	SMDZ	Middle door area signal	
	3	SUDZ	Upper door area signal	
	4	LOW	Low speed signal	
	5	POU	Pre-opening request output terminal	
	6	COM5		
P3	1	A220	Short circuit lobby door and car door lock circuit	

No.	Pin	Terminal code	Terminal definition	Remark
	2	A30		
	3	A22		
	4	POF	Provide relay adhesion detection point	
	5	POC	Advance opening/creeping leveling response signal	
	6	CM	Common terminal of digital input signal	

10.10.6 Instruction of LED

Name	Instruction
D1	When J1 relay acts (closes), D1 is on.
D4	When J2 relay acts (closes), D4 is on.
D7	When TJ1 relay acts (closes), D7 is on.
D8	When J3 relay acts (closes), D8 is on.

10.10.7 Wiring diagram of EC-RDB and peripheral interface

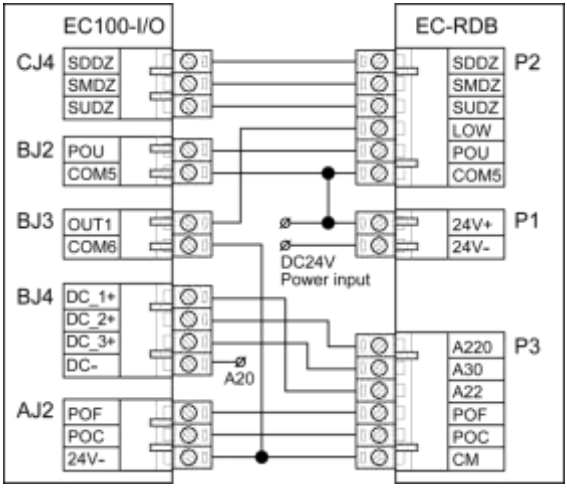


Figure 10-28 Wiring diagram of EC-RDB and peripheral interface

10.11 Instructions for EC-UCM controller

EC-RDB adopts four safety relays with highly reliable design and has passed the certification of the elevator safety circuit test.

10.11.1 Installation dimension

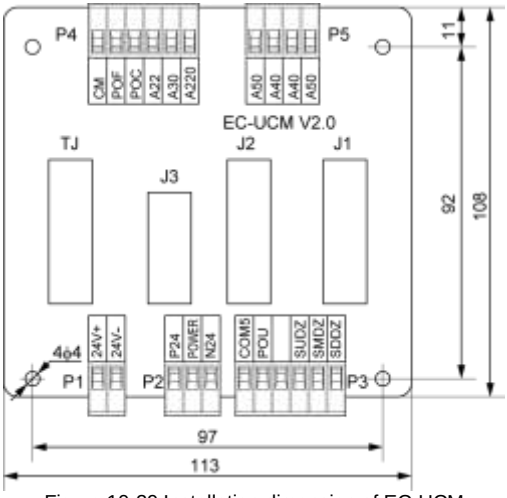


Figure 10-29 Installation dimension of EC-UCM

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.

10.11.2 Configuration requirement

Name	Function	Qty.	Position
EC-UCM	Advance door opening/creeping leveling/asynchronous motor UCMP detection	One for each elevator	In control cabinet

10.11.3 Specification of the connectors

No	Model
P1	2EHDVC-5.08-2
P2, P3	2EHDVC-5.08-6
P3	2EHDVC-5.08-6
P4	2EHDVC-5.08-6
P5	2EHDVC-5.08-4

10.11.4 Electrical specification

10.11.4.1 Specification of the PCB board

Name	EC-UCM
Color	Green

Thickness	1.6mm
Layers of layout	2

10.11.4.2 Specification of the power supply

Standard input voltage range	DC22V~DC26V

10.11.4.3 Working environment

Temperature	0 °C ~ 70 °C
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

10.11.5 Definition of the input/output interface

10.11.5.1 Definition of P1 terminal

P2 terminal is for providing working power terminal for MC-GCL group control board and is supplied by external DC24V switch power.

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, P3, P4 and P5

P2 is connection terminal for door area switch polarity selection, P3 is connection terminal for door area input and door open running request from main board, P4 is connection terminal for door lock short circuit and short circuit feedback signal, P5 is connection terminal for control circuit of additional braking unit.

NO.	Pin1	Symbol	Definition	Remark
P2	1	P24	connection terminal for door area switch polarity selection	When low level input of door area switch is valid, the POWER is short circuited with P24, or when high level is valid, POWER is short circuited with N24.
	2	POWER		
	3	N24		
P3	1	COM5	Input signal of door open running request	Internal breakover of COM5 and 24V+
	2	POU		
	3	Not connected		
	4	SUDZ	Upper door area signal	
	5	SMDZ	Middle door area signal	

NO.	Pin1	Symbol	Definition	Remark
	6	SDDZ	Lower door area signal	
P4	1	A220	Lobby door lock circuit	No need for connection after MCU V1.18
	2	A30	Car door lock circuit	
	3	A22	Safety circuit	
	4	POC	Door lock short circuit feedback signal	Common terminal of CM connect mainboard input point
	5	POF		
	6	CM		
P5	1	A50	Connect car door lock vice contact	Contact capacity: AC220V/6A, additional contactor is needed when power is not enough.
	2	A40		
	3	A40	Connect additional braking unit control circuit	
	4	A50		

10.11.6 Instruction of LED

Indicator	Instruction
LE1	When TJ relay closes, LE1 is on.
LE2	When J3 relay closes, LE2 is on.
LE3	When J2 relay closes, LE3 is on.
LE4	When J1 relay closes, LE4 is on.
PWR	When POWER is short circuited with P24, PWR is on, it means the door area signal is low level input valid.

10.11.7 Wiring diagram of EC-UCM and peripheral interface

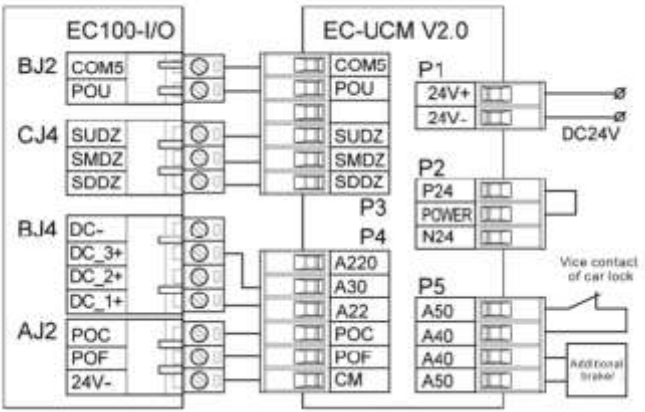


Figure 10-30 Wiring diagram of EC-UCM and peripheral interface

10.12 Instructions for LM21

LM21 is the 7” colored display for CAN communication. It supports many functions such as image switching, voice reporting, lobby calling registration, lock elevator and fire safety.

10.12.1 Installation dimension of LM21

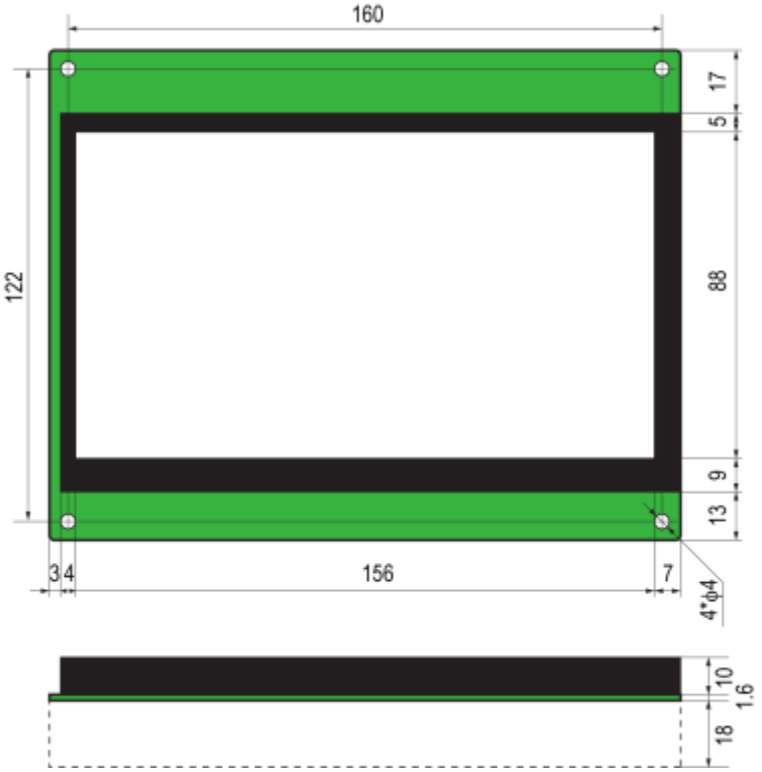


Fig 10-31 LM21 installation dimension

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.

10.12.1 LM21 terminal instruction

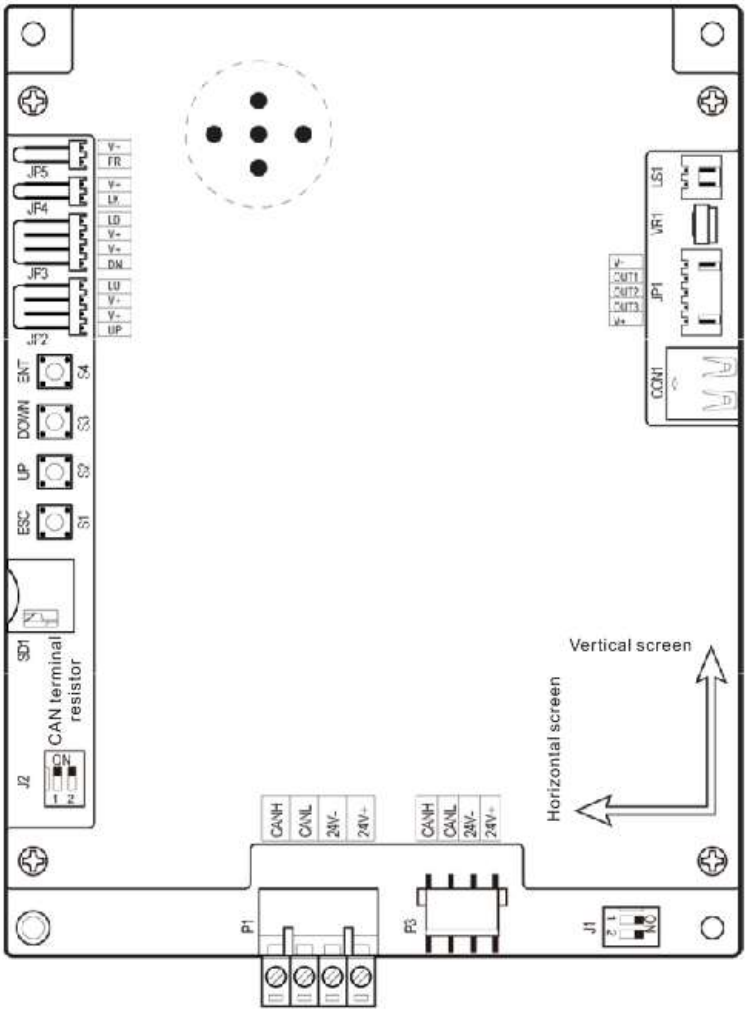


Fig 10-32 Backside terminal diagram of LM21

NO.	Pin	Symbol	Definition	Remark
P1	1	CANH	Power input and CAN communication terminal	EC508V-04P
	2	CANL		
	3	24V-		
	4	24V+		
P3	1	CANH	Power input and CAN communication terminal	VH-4L

NO.	Pin	Symbol	Definition	Remark
	2	CANL		
	3	24V-		
	4	24V+		
JP1	1	V+	24V+power lead-out terminal	XH-5 Needs to expand DC-03K
	2	OUT3	Output terminal of lobby calling arrival gong	
	3	OUT2	Output terminal of down running forecast light	
	4	OUT1	Output terminal of up running forecast light	
	5	V-	24V-power lead-out terminal	
JP2	1	LU	Output terminal of up running button indicator	XT-4
	2	V+		
	3	V+	Input terminal of up running button	
	4	UP		
JP3	1	LD	Output terminal of down running button indicator	XT-4
	2	V+		
	3	V+	Input terminal of down running button	
	4	DN		
JP4	1	V+	Input terminal of lock elevator	XT-2
	2	LK		
JP5	1	V+	Input terminal of fire safety	XT-2
	2	FR		
LS1			Connection terminal of horn	XH-2
VR1			Potentiometer for volume adjustment	
S1		ESC	Exit (return) button	
S2		UP	Up button	
S3		DN	Down button	
S4		ENT	Enter (confirm) button	
J1			Back-up	
J2			CAN communication terminal resistor	Valid when it is in “ON” position
CON1			Back-up	USB female
SD1			TF memory card slot	Update display document

10.12.3 Parameter operation instruction for LM21

1. Press ENT and LM21 will enter main menu setting interface;

2. Press UP/DOWN to select menu item;

3. Press ENT to enter the selected menu, view or modify parameters by UP/DOWN

4. After parameter modification, press and hold down ENT to save and return to main menu interface (press ESC will return to main menu without saving)

5. Press ESC to exit from the setting interface

10.12.4 Menu function introduction for LM21

NO.	Menu introduction	Function description	Function selection
1	Menu language: Chinese/English	Set the language for menu interface	Chinese/English
2	Floor address setting	Set floor address	0~64 (in the car, set to 0)
3	Date and time setting	Set the displayed date and time	Date and time
4	Selection of running arrow	Set the arrow to be displayed during elevator running	Flicker/static
5	Image switching mode	Set the switching mode for background image	Timed switching/switching by floors
6	Image fresh mode	Set the refresh mode of background image	Refresh by rows/pages
7	Running mode	Set the running mode of LM21	Normal/demonstration
8	Welcome words type selection	Set the type of welcome words to be displayed	Rolling/static
9	Protocol selection	Set the communication protocol of LM21	Internal/open
10	Fire enabling	Set fire enabling of LM21	Fire/invalid
11	Lock elevator enabling	Set lock enabling of LM21	Lock/invalid
12	Rear door enabling	Set LM21 as rear door enabling	Rear door/invalid
13	Voice reporting enabling	Set voice reporting enabling of LM21	Reporting/invalid
14	Volume adjustment	Set the voice reporting volume of LM21	0%~100%
15	Energy-saving control	Set energy-saving enabling of LM21	Energy-saving/invalid
16	Program version NO.	Current software version of LM21	Read-only

Chapter 11 Maintenance and hardware diagnosis

11.1 Maintenance intervals

If installed in an appropriate environment, EC100 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
		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

Checking part		Checking item	Checking method	Criterion
				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 capacitor	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 the static capacity.	Measure the capacity by instruments.	The static capacity is above or equal to the original value *0.85.
	Resistor	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.
	Transformer and reactor	Ensure there is no abnormal vibration, noise and smelling,	Hearing, smelling and visual examination	NA
	Electro-magnetic contactor and relay	Ensure whether there is vibration noise in the workrooms.	Hearing	NA
		Ensure contactor is good enough.	Visual examination	NA

Checking part		Checking item	Checking method	Criterion
Control circuit	PCB and plug	Ensure there is no loose screw 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
		Ensure there is no weeping and distortion to the capacitors.	Visual examination or estimate the usage time according to the maintenance information	NA
Cooling system	Cooling fan	Estimate whether there is abnormal noise and vibration.	Hearing and Visual examination or rotate with hand	Stable rotation
		Estimate there is no loosened 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 drive's cooling fan has a minimum life span of 25,000 operating hours. The actual life span depends on the drive 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 drive 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 and disconnect it from the AC power source.
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 drive has been stored for a long time. The storing time is counted form the producing date other than the delivery data.

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 drive • Apply 25% rated voltage for 30 minutes • Apply 50% rated voltage for 30 minutes • Apply 75% rated voltage for 30 minutes • Apply 100% rated voltage for 30 minutes
Storing time more than 3 years	Use power surge to charge for the drive • Apply 25% rated voltage for 2 hours • Apply 50% rated voltage for 2 hours • Apply 75% rated voltage for 2 hours • Apply 100% rated voltage for 2 hours

The method of using power surge to charge the drive:

The right selection of power surge depends on the supply power of the drive. Single phase 230V AC/2A power surge applied to the drive with single/three-phase 230V AC as its inlet voltage. The drive with single/three-phase 230V AC as its inlet voltage can apply single phase power surge (L+ is connected with R, N with S or T). All DC bus capacitors will be charged at the same time because the rectifier is the same one.

High-voltage drive needs enough voltage (for example, 400V) during charging. The small capacitor power (2A is enough) can be used because the capacitor needs nearly no current when charging.

The operation method of drive charging through resistors (incandescent lamp):

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 drive 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.

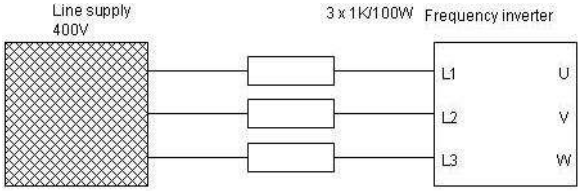


Figure 11-1 400V charging circuit of the drive device

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 drive exceed 35000H. Please contact our company 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 10 minutes to allow the drive DC capacitor to discharge. Measure with multimeter (the impedance is at least 1MΩ) to ensure the capacitor is fully discharged.
2. Check the tightness of the power cable connections.
3. Restore power.

Chapter 12 Fault code

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
1	1		Main control board fault	Internal fault	Replace the main control board	Stop immediately
2	2		Power fault of IO board	1. External DC 24V power is damage or cable is broken 2.Connection cable between IO board and the master is disconnected	1.Check the cable connection between IO board and master 2.Check the 24V power supply	Stop immediately; fault reset automatically
3	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		Pulse reversion	1.Pulse direction parameters fault 2.Running direction of the elevator reverses 3.Elevator slides seriously	1.Modify the parameter: counting direction 2.Set load compensation 3.Reautotuning of the master	Stop immediately; fault reset automatically
5	7		People-trapped fault	1. Door lock is short circuited along with NO.32 fault; 2. The sill is blocked by garbage along with NO.60 fault; 3. Door operator fault along with NO.60 or NO.62 fault; 4. Car top board is abnormal along with NO.11 or NO.60 fault. 5. Door lock is disconnected during	1. Remove the door lock shot circuit cable; 2. Clean the garbage in the sill; 3. Check the door operator: 4. Check car top board and communication line; 5. Check door lock	Keep stopping. Fault reset automatically.

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
				running.		
6	8		Brake force detection fault	1. The brake travel switch acts abnormally along with NO.54 or NO.55 fault; 2. The monitoring torque is not reached maybe along with OL fault: 3. During monitoring, the accumulated rotation of the tractor exceeds 40mm or the set value of F0.95 after reaching the monitoring torque.	1. Check the brake travel switch; 2. Re-conduct manual monitoring when the balancing coefficient is normal; 3. Check the brake mechanism; 4. Increase the F0.95 deviation value or F0.96 balancing coefficient properly.	Keep the door closed and fast running is prohibited. Fault set, it is necessary to monitor brake force manually.
7	9		Motor thermal protection	Motor thermal protection input acts	1.Check logic and connection of input point 2. Improve motor cooling condition.	Stop nearby and do not run. fault restored and reset at a delay
8	10		Lobby calling communicat ion fault	1. The main controller cannot establish communication with lobby calling or the communication is time-out; 2. The version of lobby calling is outdated.	1. Check the communication cable and relevant connectors; 2. Check if lobby calling communication protocol is correct; 3. Set F0_83 and cancel NO.10 fault.	Does not affect fast running. Fault reset automatically.
9	11		Car communica-tion fault	No communication between the controller and the car or the communication is	1.Check the communication cable and relevant connectors;	Stop nearby and fast running is prohibited.

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
				time-out	2.Check if DC24V power is normal; 3.Check if internal calling communication protocol is correct; 4. Baud rate of communication IC card is set incorrectly	fault reset automatically
10	13		Communication-type door operator fault of front door	1. protocol of communication-type door operator l is incorrect; 2. F0_17 setting is wrong	1. Check communication cable and relevant connectors; 2. Check F0_17	Do not run. Fault reset automatically.
11	14		Communication-type door operator fault of rear door	1. protocol of communication-type door operator l is incorrect; 2. F0_17 setting is wrong	1. Check communication cable and relevant connectors; 2. Check F0_17	Do not run. Fault reset automatically.
12	30		Safety circuit disconnection	1.Safety circuit disconnection; 2.Damage to the contact of safety circuit 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
13	31		Door lock open in running	1.Misadjustment of the position of the door knife 2.Poor connection of the door lock contact 3.Poor connection of	1.Adjust the door lock device; 2.Replace the contactor of the door lock; 3.Check the circuit of	Stop immediately; fault reset automatically

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
				the car lock or lobby lock	the door lock	
14	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 is not disconnected	1.Check the short circuit of the door lock 2.Check the misaction of the switch 3.Check the door operator	Do not run. fault reset automatically
15	33		Does stop at the door area during fast running	Elevator protection caused by other faults during fast running.	Analyze with other faults	Fault tips
16	34		DEC section overtime	The deceleration time exceeds the time calculated in the parameter during fast running.	1.Sliding of the elevator rope 2.Wrong parameters setting of DEC section	Stop immediately; reset automatically
17	35		Single floor running overtime	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
18	37		Running overtime fault during whole journey	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
19	39		Abnormal elevator position	1. Hoistway autotuning is not done; 2. Hoistway switch position is abnormal; 3. The elevator exceeds the terminal leveling position by the	1. Redo hoistway autotuning; 2. Re-adjust the position of forced DEC switch according to recommended	Do not run. Fault reset manually.

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
				distance of two door area ranges.	distance; 3. Adjust pulse direction.	
20	40		Abnormal signal in door area	Stay in the door area after fast running starts for 5s	1.Check if the brake device is open 2.Check the switch in door area	Stop immediately; fault reset manually
21	42		DEC forced switch of the bottom and top floor act simultaneously	Low speed deceleration forced switch of the bottom and top floor act at the same time	1.Check if the forced switch is damaged or disconnected 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
22	43		Earthquake action	The main board detects the earthquake	1.Check the corresponding logic setting 2.Corresponding detection point is damaged	Function tips
23	44		Overspeed running at terminal station	When the elevator runs to terminal station and forced DEC switch acts, the speed exceeds the corresponding speed of the switch	1. The switch is damaged or disconnected; 2. The installation position of forced DEC switch is too low.	Stop immediately. Fault reset automatically.
24	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
25	47		Down limit switch act	Low speed down limit switch acts	1.Check the installation position of the down limit switch 2.Check the	Stop immediately; fault reset automatically

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
					corresponding logic setting 3.Check the switch wiring	
26	48		Up limit switch acts	Low speed up limit switch acts	1.Check the installation position of the up limit switch and switch circuit; 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
27	50		Overtime of the running contactor closing	No feedback after the running contactor closing	1.Replace the contactor; 2.Check the peripheral wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
28	51		Overtime of the running contactor opening	Feedback exists after the running contactor releasing	1.Replace the contactor 2.Check the peripheral wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
29	52		Overtime of the braking contactor closing	No feedback after the braking contactor closing	1.Replace the contactor 2.Check the peripheral wiring 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
30	53		Overtime of the braking contactor opening	Feedback exists after the braking contactor releasing	1.Replace the contactor 2.Check the peripheral wiring	Stop immediately; fault reset automatically

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
					3.Check the corresponding logic setting	
31	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 mistakenly set to dual brake	1.Adjust the position of brake travel switch; 2.Adjust brake gap; 3. Poor contact of brake travel switch; if brake travel switch is not installed, short circuit to the detection point of brake contactor; 4.Check the corresponding logic setting 5. Check the definition of MF input	Stop immediately; fault reset automatically
32	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 closes slowly 4.The MF input is mistakenly set to dual brake	1.Adjust the position of brake travel switch 2.Adjust brake gap 3. Poor contact of brake travel switch; 4.Check the corresponding logic setting	Stop immediately; fault reset automatically
33	56		UPS output relay closing overtime	No feedback is detected after UPS power switching	1.Check peripheral wiring 2.Check UPS output relay	Prohibit UPS returning-to-leveling; fault reset automatically after exiting

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
						UPS
34	57		Star-delta contactor closing overtime	1.No star-delta feedback is detected after elevator starts 2. Mistakenly set MF input as star-delta independent output.	1.Check peripheral wiring 2.Check the corresponding logic setting 3.Check the definition of MF input	Prohibit the elevator from starting; fault reset automatically
35	58		Hardware enabling adhesion	No detection of the hardware enabling signal after the elevator starts	1.Check the connection cables of IO board 2.Check the contact of running contactor and connection	Stop immediately; fault reset automatically
36	59		Star-delta contactor opening overtime	1. Star-delta contactor feedback is detected after elevator stop. 2. Mistakenly set MF input as star-delta independent output	1.Check peripheral wiring 2.Check the corresponding logic setting 3.Check the definition of MF input	Prohibit the elevator from starting; fault reset automatically
37	60		Opening fault	No detection of the open signal after opening for 20s	1.Clean the door sill 2.Enlarge the low speed torque of door operator 3.Check the corresponding logic setting and position of open switch	Fault tips
38	61		Closing fault	No detection of the closed signal after closing for 10s	1.Clean the door sill 2.Enlarge the low speed torque of door operator; 3.Check the corresponding logic setting and position	Fault tips

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
					of closed switch	
39	62		Door closed/ open act at the same time	Limit switch of door closed/open act at the same time	1.Limit switch is damage 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
40	64		Safety edge /beam action overtime	Continuous overtime action of safety edge / beam	1.Human obstruction 2.Detection point is damaged, disconnected or short circuited; 3.Check the corresponding logic setting	Fault tips
41	65		Auto aid acts	The detection of auto aid signal by the main board	1.Check the corresponding logic setting 2.Corresponding detection point is damaged	Function tips
42	66		Door lock blocked when door closed	Door lock blocked when door closed	1.Adjust the switch position of the door operator 2.Replace lock device 3.Check the corresponding logic setting	Stop immediately; fault reset automatically
43	67		Door lock of non-stopping floors is blocked	Door lock of non-stopping floors is blocked	1. Adjust switch point position of door operator; 2. Replace door lock device; 3. Check if lobby calling board H parameter of the	Do not run. Fault reset automatically.

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
					fault floor is set.	
44	70		UP/DOWN slow limit switch act simultaneously	UP/DOWN slow limit switch act at the same time	1.Switch damage or disconnection 2.Check the corresponding logic setting	Stop immediately; fault reset automatically
45	71		UP/DOWN secondary forced DEC switch act at the same time	The forced medium speed forced deceleration switches act at the same time	1.Switch damage or disconnection 2.Check the corresponding logic setting	Emergency deceleration to leveling, do not run. Fault reset automatically
46	72		DOWN low speed forced DEC switch adhesion	Low, medium speed forced deceleration switch of down terminal 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	Leveling nearby, do not run downward; fault reset automatically
47	73		UP low speed forced DEC switch adhesion	Low, medium speed forced DEC switch of up terminal do not reset when the elevator leaves the top floor for 9s	1.Switch damage or disconnection 2.Check the speed or deceleration/acceleration curve setting	Leveling nearby, do not run upward; fault reset automatically
48	74		Down medium speed forced DEC switch adhesion	Down medium speed forced deceleration switch does not reset when the elevator leaves ground floor for 9s	Switch damage or disconnection	Leveling nearby; fault reset automatically
49	75		Up medium speed forced DEC switch adhesion	Up medium speed forced deceleration switch does not reset when the elevator leaves top floor for 9s	Switch damage or disconnection	Leveling nearby; fault reset automatically

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
50	76		Forced DEC switch mal-function	During up running, the up forced deceleration switch mal-function occurred; during down running, down forced deceleration switch mal-function occurred	Switch damage, cable disconnection or floor split	Emergency deceleration to leveling; fault reset automatically
51	77		Down slow running limit adhesion	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
52	78		Abnormal DEC switch action	1. The update program does not carry out hoistway autotuning, enabling this protection function; 2. The elevator slips.	1. Redo hoistway autotuning; 2. Check on the slip and make mechanical adjustment.	Emergency deceleration to leveling. Fault reset automatically
53	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. Hoistway information is lost or is inconsistent with the autotuning results	1.Check low speed forced DEC switch and circuit; 2.High speed counting pulse and door area signal is lost; 3.Check if the steel rope slips; 4.Check the corresponding logic setting 5. Hoistway autotuning is not done after adjusting	Open the door to let passengers out and returning to the bottom floor for correction. fault reset automatically

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
				4.Wrong floor	hoistway switch	
54	80		UCM fault	1. Door area switch is damaged or disconnected; 2. Brake failure	1. Check the door area switch; 2. Check the brake	Stop immediately. Fault reset automatically.
55	82		Contactor adhesion fault exceeds the setting	No. 50, 51, 52, 53, 54, 55, 57, 59 fault occurred more than 5 times	Replace the corresponding contactor or supplementary contact	Stop immediately; fault reset after power off
56	83		Drive unit fault exceeds the setting value	Drive unit fault continuously exceeds the set value of P5.07	Rule out the fault cause	Stop immediately; fault reset after power off
57	86		UCM failure	UCM board circuit is abnormal	Replace UCM board	Stop immediately; Fault reset automatically.
58	89		Maintenance switch acts in running	1. Manual maintenance switch acts 2. Poor contact of inspection circuit or switch	Check the inspection switch and circuit	Stop immediately
59	101		Inverter unit U phase protection	1.The output of the main circuit is grounded or short circuited 2. Connection wires of the tractor is too long 3.Internal damage to IGBT 4.Internal connection of the controller is loose	1.Rule out the external causes such as wire connection 2.Install with reactor or output filter 3.Contact the manufacturer 4.Check the internal problems such as connection	Stop immediately; fault restore, fault reset when power off
60	102		Inverter unit V phase protection			
61	103		Inverter unit W phase protection			

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
62	104		ACC overcurrent	1.The output of the main circuit is grounded or short circuited 2.Wrong parameter setting of master nameplate 3.Too large load 4.Wrong encoder signal 5.Acceleration/deceleration is too fast	1.Check the master parameter 2. Check the encoder feedback and signal. 3.Adjust S curve 4.Re-do motor autotuning 5.Check if the brake is open totally 6.Check if the star connection of synchronous master is adhesive; 7.Check the mechanical stuck 8.Check the balance coefficient	Stop immediately; fault reset automatically
63	105		DEC overcurrent			
64	106		Constant speed overcurrent			
65	107		ACC overvoltage	1.Too high input voltage 2.Serious counter EMF of the tractor 3.Large braking resistor or abnormal braking unit 4.Acceleration/deceleration is too fast	1.Check if the bus voltage is normal or rises too fast during running; 2.Check the balance coefficient 3.Select suitable braking resistor (refer to the recommended parameter table for braking resistor in chaptor 2) 4.Check if the connection cable of braking resistor is broken or grounded or reliable.	Stop immediately; fault reset automatically
66	108		DEC overvoltage			
67	109		Constant speed overvoltage			

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
					5.Adjust S curve	
68	110		Undervoltage fault	1.Sudden off of input power 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 surface of all the input power supply 3.Contact the manufacturer	Stop immediately; fault reset automatically
69	111		Motor overload	1.Wrong parameters setting 2.Abnormal brake circuit 3.Too heavy load	1.Adjust the parameters 2.Check the brake circuit	Stop immediately; fault reset automatically
70	112		System overload	1. Abnormal brake circuit 2.Too large load 3.Check the encoder feedback signal 4.Check master parameters 5.Check the power cable of the master	1.Check the brake circuit and brake-releasing device; 2.Reduce the load; 3.Check the feedback signal of the encoder and the original magnetic pole angle of the encoder; 4.Check if motor parameters are set correctly; 5.Check the power cable of the master	Stop immediately; fault reset automatically
71	113		Phase loss in input side	1.Asymmetrical input power 2.Abnormal drive	1.Set through the parameters 2.Check the 3 phase	Stop immediately; fault reset

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
				control board	power supply in input side and the power voltage 3.Contact the manufacturer	automatically
72	114		Phase loss in output side	1.Loose connection of the main circuit output 2.Damage to the master	1.Check the contactor in input side; 2.Rule out the master fault	Stop immediately; fault reset automatically
73	115		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 countermeasure 2.Reconfigure 3.Dredge the air duct or change the fan 4.Reduce the environment temperature 5.Contact the manufacturer	Stop immediately; fault reset automatically
74	116		Overheat of the inverter module			
75	118		485 communica-tion fault		Check the parameters setting	Fault tips
76	119		Current detection fault	1. Poor contact of control board connector; 2.Auxiliary power damage; 3.Hall device damage; 4. Abnormal amplifying circuit 5.No enabling of the drive module	1.Check the cable between 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

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
77	120	C0	Autotuning fault of the motor	1.Wrong setting of the autotuning static current of the master 2.Wrong setting of rated motor parameters; 3.The capacity of motor does not match that of the drive board 4.The running contactor does not close	1.Adjust the autotuning static identification current properly; 2.Set the rated parameters according to motor nameplate 3.Check the motor connection 4.Change the drive board	Stop immediately; fault reset automatically
78	121	C1	Encoder disconnection	1.Encoder damage or cable broken 2.Too short detection time for disconnection	1.Check the encoder direction and connection 2.Check if the brake fully opens 3.Check the speed setting	Stop immediately; fault reset automatically
79	122	C2	Encoder reversion	1.Encoder signal wires is connected reversely 2.Too short time for reverse detection	1.Serious sliding 2.Change the encoder direction and redo master autotuning	Stop immediately; fault reset automatically
80	125	C5	Magnetic pole position detection is wrong	Abnormal magnetic pole position detection of the synchronous master	Change the encoder direction and redo master autotuning	Do not run.
81	126	C6	Braking circuit fault	1.Damage to the braking circuit or braking pipes 2.Low external braking resistance	1.Check the braking unit 2.Replace with new braking pipe 3.Increase the braking resistance	Stop immediately; fault reset automatically

No.	Controller fault code	LED fault code	Fault instruction	Fault reason	Solution	Method
82	131		CPU abnormal	CPU communication overtime	1.Restart after system power-off 2.Replace the main controller	Stop immediately; fault reset automatically
83	132		Excessive speed deviation	1. Excessive rotating speed deviation 2.Running too fast 3.Over adjustment of the system	1.Check the encoder and its connection 2.Adjust the gain 3.Re-do master autotuning	Stop immediately; fault reset automatically
84	137		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 its connection 2.Check the contact of the running contactor	Stop immediately; fault reset automatically
85	138		Motor short circuit to-ground software fault	1.Damage to the motor cables, contact with the shell; 2. Motor insulation is broken, 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		Motor to the ground hardware 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 reset when power off

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 content						
Meaning	0	1	2	3	4	5
Displayed content						
Meaning	6	7	8	9	A	B
Displayed content						
Meaning	C	D	E	F	H	L

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