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Chapter I General Introduction on Functions

1.1 Listing of Functions

No.	Descriptions	Remarks	No.	Descriptions	Remarks
Standard			**Optional**		
1	Fully Selective Control		**1**	Fire Emergency Return	
2	Inspection Travel		**2**	Fireman Service Operation	
3	Self-rescue Travel		**3**	The Second Car Panel	
4	Testing Travel		**4**	Duplex Control	
5	Clock Control		**5**	Arrival Gong on Car	
6	Automatic Control for Door-opening Time		**6**	Arrival Lamp on Landing	
7	Open the Door from This Landing Call		**7**	Arrival Gong on Landing	
8	Pre-close the door by Door-closing Button		**8**	VIP Priority Service	
9	Open the Door by Door-opening Button		**9**	Emergency Levelling at Power-off	
10	Automatically Door Opening Repeat		**10**	Voice Landing Forecasting	
11	Leveling in Changing Destination Landing		**11**	Output and display suspended service	
12	Cancel a Wrong Registration				
13	Clear Registrations at Changing Direction				
14	Direct Landing				
15	By-passing Landing Calls on Full-load				
16	Power-off for Car Lighting and Fan at Stand-by				
17	Auto homing				
18	Seven segment display and Operating Panel				
19	Analogic Speed Given				
20	Digital Speed Given				
21	Historical Error Log				
22	Self-learning of Shaft Information				
23	Service Landing Setting at Will				
24	Indicating Symbols Setting for Landing Display				
25	Attendant Service				
26	Independent Travel				
27	Dot-matrix Landing Indicators				
28	Rolling Indication of the Travel Direction				
29	Automatic Correction in Landing Position Signals				

30	Lift Lock-out				
31	Protection against Door-opening outside Door Zones				
32	Light Gate Protection for Doors				
33	Over-load Protection				
34	Anti-nuisance at Light-load				
35	Reversing Protection				
36	Rope-slippage Protection				
37	Car-slippage Protection				
38	Protection against Overtrip				
39	Contact Detecting in Safety Relays and Contactors				
40	Protection in Speed Regulator at Fault				
41	Master CPU Protection by WDT				

1.2 A Brief on Functions

- **Standard Functions：**

1．Fully Selective Control

When in automatic or attendant control, the lift stops in response to the in-car registrations while automatically follows landing calls up and down, i.e., a passenger can register his or her call at any landing.

2．Inspection Travel

It is a function for field mechanics or engineers to carry out maintenance, inspection or testing tasks. When operational conditions are satisfied, an authorized person can inch the car by pressing and releasing the red button, he can move the car at inspection speed by continuously pushing down the button and stop it by releasing the button.

3．Self-rescue Travel

When the lift stays out of the leveling zone (NOT in inspection state), it will automatically move to the leveling zone slowly to evacuate the passengers if only the safety requirements for the start are met.

4．Testing Travel

It is a function designed for measuring the performance of a new lift. By setting a given parameter in testing travel on the Master Control board, a field engineer will put the lift into automatic operation. Both the total number of trips and the interval time between trips of the testing travel can be determined by parameter setting.

5．Clock Control

With the built-in clock system by real time, the exact time at which a breakdown takes place can be recorded in the Error Log. The clock control can also be used to initiate the required functions precisely by time.

6．Automatic Control for Door-opening Time

When the lift travels in automatic state without attendant, the door closes automatically by a delay after the car

arrives at a landing with the door open. The default delay is 3.0 s for a landing without any call and 3.0 s for a landing with a call. The delay time can be changed by setting the relevant parameters.

7．Open the Door from This Landing

When the call button of this landing is pressed down, the car door opens automatically. If someone keeps pushing on the button, the door remains open.

8．Pre-close the Door by Door-closing Button

When the door is open in automatic state, the door can be closed immediately before the delay elapses by pushing on the door-closing button.

9．Open the door by Door-opening Button

When the car stays within the door zone, a passenger in the car can open a closed door or make a closing door reverse by pushing on the door-opening button.

10．Automatically Door Opening Repeat

If the door has been closing for 15 seconds without locking up successfully, the lift will return to door-opening status.

11．Leveling on Changing Destination Landing

If the door has been opening for 15 seconds without activating the door open limit switch, the door will close and the lift will travel to the next destination after the door is closed.

12．Cancel a Wrong Registration

If a passenger realizes that he or she has pushed down a wrong button in the car panel, he or she can cancel the wrong registration by pushing the same button twice incessantly.

13．Clear Registrations at Changing Direction

When the lift car arrives at the last landing to be changing direction, all the registrations behind its present travel will be cancelled at once.

14．Direct Landing

On analogue given curve the control system slows down the lift by distance without any crawling at leveling.

15．By-passing Landing Calls on Full-load

When a full-loaded lift car travels in normal mode without attendant, the lift will NOT answer any calls from its by-passing landings, stopping at the landings by in-car registrations only.

16．Power-off for Car Lighting and Fan at Stand-by

If a lift stands by out of service over 5 minutes (default value subject to change by parameter), receiving neither in-car nor landing calls, the car lighting and fan will automatically stays off power until a call for the lift to answer appears.

17．Auto Homing

When the lift travels in automatic state without attendant service while setting Auto Homing in effect, the lift car which receives neither in-car nor landing calls will automatically return to the main landing within a given period

of time determined by parameter setting.

18．Seven segment display and Operating Panel

The Seven segment display and operating panel on Master Control Board displays the rated speed, traveling speed, direction and status. It can also be used for looking up faults and breakdowns of the lift in the record log.

19．Analogic Speed Give

The traveling speed curve is generated automatically by analogic speed reference with deceleration by distance for direct landing, which enhances the traveling efficiency of the lift.

20．Digital Speed Reference

In case the inverter has no analogue-controlled given, the multi-sectioned digital speed reference will be applied, which fends off interference effectively.

21．Historical Fault Log

The Historical Fault Log keeps the latest 20 fault records concerning the occurring time, floors and fault codes.

22．Self-learning of Shaft Information

The Self-learning should be initiated before the lift goes into service for the control system to learn the pertaining hoistway data such as distance between floors, positions of decelerating and protective switches and so on and keep the learned data permanently in memory.

23．Service Landing Setting at Will

Using the hand-operator one can determine at will which floors the lift serves and which floors the lift does NOT serve.

24．Indicating Symbols Setting for Landing Display

Using the hand-operator one can determine at will the varied display symbols or marks for the floors, for instance, “B” for basement ONE.

25．Attendant Service

Using the switch in the car operation panel, one can put the lift into attendant service, under which the automatic door closing is blocked out and the door can only be closed by the attendant who keeps pressing on the door-closing button. The attendant can also decide on the travel direction and/or the by-passing ride. The other functions are the same as those by normal travel.

26．Independent Travel

Independent Travel is an exclusive travel, during which the lift overlooks all landing calls and the automatic door-opening and -closing is blocks out. Other features are similar to Attendant Service.

27．Dot-matrix Landing Indicators

Dot-matrix Landing Indicators are used both in the car and on the landing, featuring abundant and elegant indicating symbols and vivid display.

28．Rolling Indication of the Travel

Rolling direction display is applied to both car and landing indicators, which starts when the car is moving.

29．Automatic Correction in Landing Position Signals

During the travel the system checks up its own position signals at each terminal switch and by the leveling switch of each landing against those it has obtained by self-learning, making automatic corrections in the data.

30．Lift Lock-out

During the normal service the system clears out all registrations when the lock-out switch is turned off, but the lift will continue its service dispatching passengers in the car until all the in-car registrations are cleared out. Then the car returns to the main landing, opens the door automatically, switches off lighting and fan, igniting the door-opening button for a 10-second delay before the door is automatically closed for termination of service. The normal service can be initiated again by resetting the lock-out switch.

31．Protection against Door-opening outside Door Zones

The door cannot open outside the door zone, which is preset by the system for safety.

32．Light Gate Protection for Doors

Every lift is equipped with a light gate door protection, whenever any object appears or stays between the closing door panels, they will reverse open with the light gate in effect.

33．Over-load Protection

With the over-load switch functioning, the door remains open with alarm buzzing on.

34．Anti-nuisance at Light-load

If the system is equipped with a light-load switch which has not yet functioned while the in-car registrations have exceeded value in number (subject to modify by parameter), the system will clear all the registrations.

35．Reversing Protection

When the system has detected an inconsistency between the registered direction and travel direction for 3 seconds on end, an emergency stop will be activated with alarm buzzing on.

36．Rope-slippage Protection (Operation Time Limiter)

If the lift in operation (except for in inspection mode) has traveled incessantly for a longer time than the value preset by the time limiter (max.45s) without leveling and door operations, a rope slip is supposed to be detected by the system, by which all car movements are at stop until being put into inspection travel or by resetting the power supply.

37．Car-slippage Protection

If feed-back pulses have kept coming in for 3 seconds after the system detects a lift leveling, a car-slipping is supposed to have occurred, by which the lift is prevented from operation at fault with alarm buzzing on.

38．Protection against Overtrip

Both the uppermost and the lowest ends of the hoistway are mounted with limit switches for speed retardation of the cab so that any overtrips by it can be prevented.

39．Contact Detecting in Safety Relay and Contactor

The system checks up the contact reliability of the safety relays and contactors. If any inconformity between the contact movement and the working status of the coil is detected, all car movements will stay at stop until reset of the power supply.

40．Protection in Speed Regulator at Fault

An emergency stop is activated upon any signals of fault from the speed regulator and the lift is kept out of operation at breakdown.

41．Master CPU Protection by WDT

The master control PCB is integrated with WDT protection. When any CPU or program problems are detected, the WDT Circuit will make a forced OFF at the output terminals of the Master Control and reset the CPU.

- **The Options**

1．Fire Emergency Return

In the event of fire the fire return switch is put on by man, upon which the lift will clear out all the registrations and calls, returning to the fire home as soon as possible with its door open.

2．Fireman Service

As the fireman switch is set on in case of fire, the car will stay ready for fireman service with the door open at the fire home, by which the automatic door operations are blocked and the door can only be opened or closed by pressing and releasing the buttons at short intervals. During fireman service the lift only answers to the in-car registrations and clear up all of them when it comes to a stop. The normal travel can only be restored only when both the fire return and fireman switches are reset while the car is at the fire home with its door fully open.

3．The Second Car Panel

The second car panel is usually mounted on the left-front wall in the car with the same buttons and switches as those in the master panel. The second car panel functions the same as the master panel does in automatic state without attendant service, but it does NOT work during attendant and independent travels.

4．Duplex Control

Duplex control is made available by CAN BUS— a serial communication bus that transfers the data in coordination of the joint call-handling capacity of the two elevators with a view to increasing the efficiency of both. The key to duplex control lies in the optimized distribution of the landing calls between the two lifts. The system works on the distance-based principle, i.e., wherever a call is registered, the control assigns it to the lift that is nearer to the registered floor so as to reduce the waiting time to the minimum. The automatic return to main landing is intergrated in that after answering all calls and registrations, the lift which stays nearer to the main landing returns to it. In this case the function of auto-return to main landing becomes optional, which can be realized by the hand-operator.

5．Arrival Gong on Car

An arrival gong mounted on the top or at the bottom of the car will sound off during the deceleration and leveling period for stop so that the passengers both in the car and on the landing will know that the lift is coming soon.

6．Arrival Lamp on Landing

With this option the direction-forecasting lamps are mounted on every landing, whereby the relevant direction lamp will flash up when the arriving car reaches the 1.2-meter distance from the floor level so that the waiting passengers on the landing will know that the lift is arriving and in which direction it is heading for. The lamp will remain flashing until the door is closed.

7．Arrival Gong on Landing

Arrival gongs with both up and down direction indications are mounted on every landing and the relevant one will sound off for the riding direction when a car is leveling in the door zone for stop so that the waiting passengers will know that this lift is arriving.

8．VIP Priority Service

With VIP Priority Service a VIP landing is preset, where a VIP switch is integrated in the landing call button panel. A VIP service is activated by resetting the switch once, whereby all the landing and in-car registrations are cancelled immediately while the car comes directly to the VIP landing with its door open. Both the automatic door closing and landing calls are now blocked out while the control enables the VIP rider to select the destination floor in the car and close the door by pushing on the door-closing button constantly. The lift will return to normal service as soon as the last VIP leaves the car.

9．Emergency Levelling at Power-off

When the car happens to be out of the door zone in the event of a power failure, an entrapment of passengers takes place. In the wake of a power failure the emergency leveling unit will start, driving the lift car to the nearest landing with the door open to release the passengers.

10．Voice Landing Forecasting

With this option the system landing announcer makes a voice announcement of the approaching floor during every leveling time and of the traveling direction of the lift before every door closing, etc.

11．Output and display suspended service:

A display method notifying passengers the service of certain elevators is suspended. This function don’t need any setting, but certain calling board & display control board able to display such characters as “service suspended” shall be provided.

Chapter II A Brief on Serial Control

2.1 Configuration of the Control System

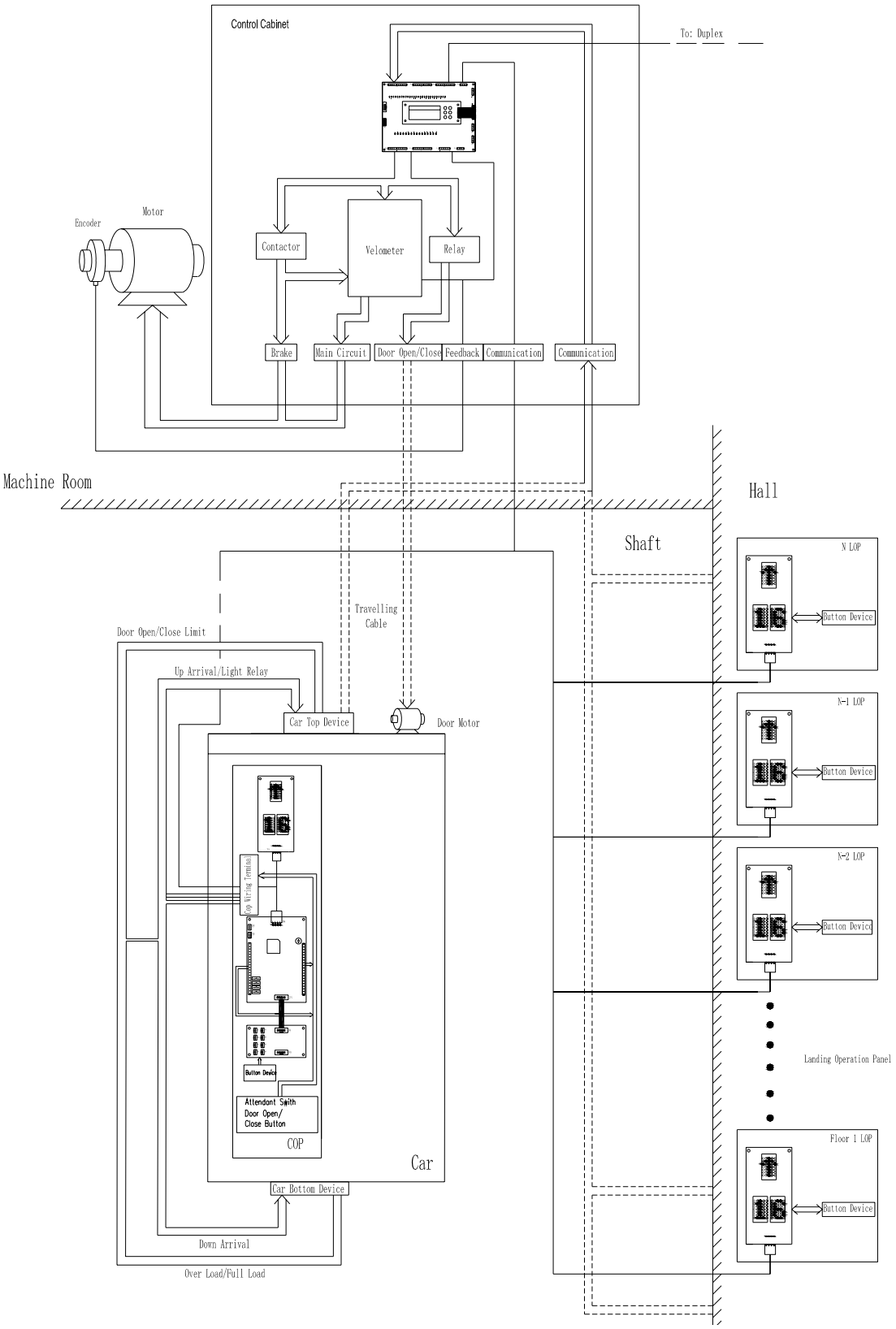


Fig. 2-1 Configuration of Serial Control System

Serial Control System			
Control Boards	Type of Control	Mounting Position	Remarks
Master Control Board	SM-01-CDA	in machine room	in control cabinet
Car Board	SM-02-D	In car operation panel	
Car Call Board	SM-03-D	In car operation panel	
Landing Call and Display Board	SM-04-VRF	in car operation panel or landing call button panel	
	SM-04-VSC	in car operation panel or landing call button panel	
	SM-04-HRC	in car operation panel or landing call button panel	
	SM-04-HSC	in car operation panel or landing call button panel	
	SM-04-VHL	in car operation panel or landing call button panel	
	SM-04-UL	in car operation panel or landing call button panel	

List 2-1 Serial Control System

2.2 Parameters of Performance

2.2.1 Features

- Fujitsu single chip microcomputer for industrial control;
- Four-ply wood surface mount process, **CAN** bus serial communication;
- High intelligence, high reliability;
- Keyboard operation, display of seven segment code;
- Supporting parallel.

2.2.2 Range of Application

- Passenger lifts，freight lifts，goods passenger lifts;
- Full selective elevators, parallel;
- Speed range of the elevator: **0-1.75m/s**;
- Applicable floor: Floor 32 or lower;
- Applicable to the front or rear opening, not to back door;
- No advance door opening;
- No supervisory control;
- No IC card function;
- No group automatic operation function.

2.2.3 Standard in Reference

- 《Safety Rules for the Construction and Installation of Electric Lifts》GB7588-2003

2.2.4 Working Temperature

- The control components work in the temperature range between 0ºC and +60ºC except for the LCD display.

2.3 Classified Descriptions

2.3.1 The Master Control Board

2.3.1.1 External and Mounting Dimensions of Master Control Board

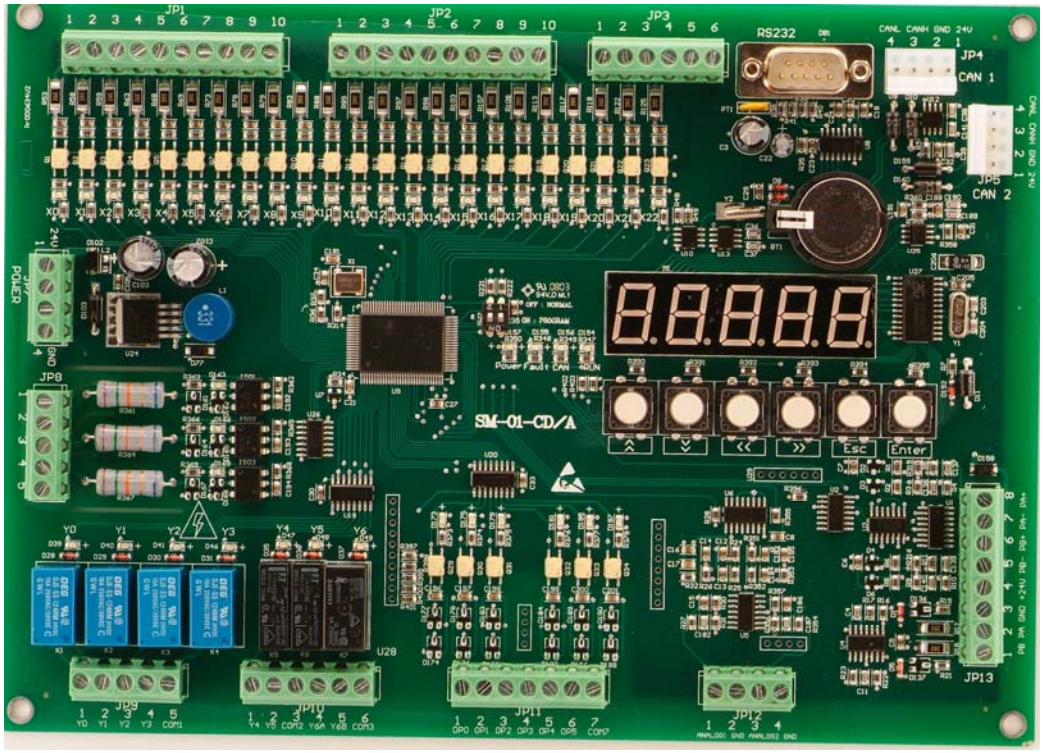


Fig. 2-2(A) Outlook of Master Control Board

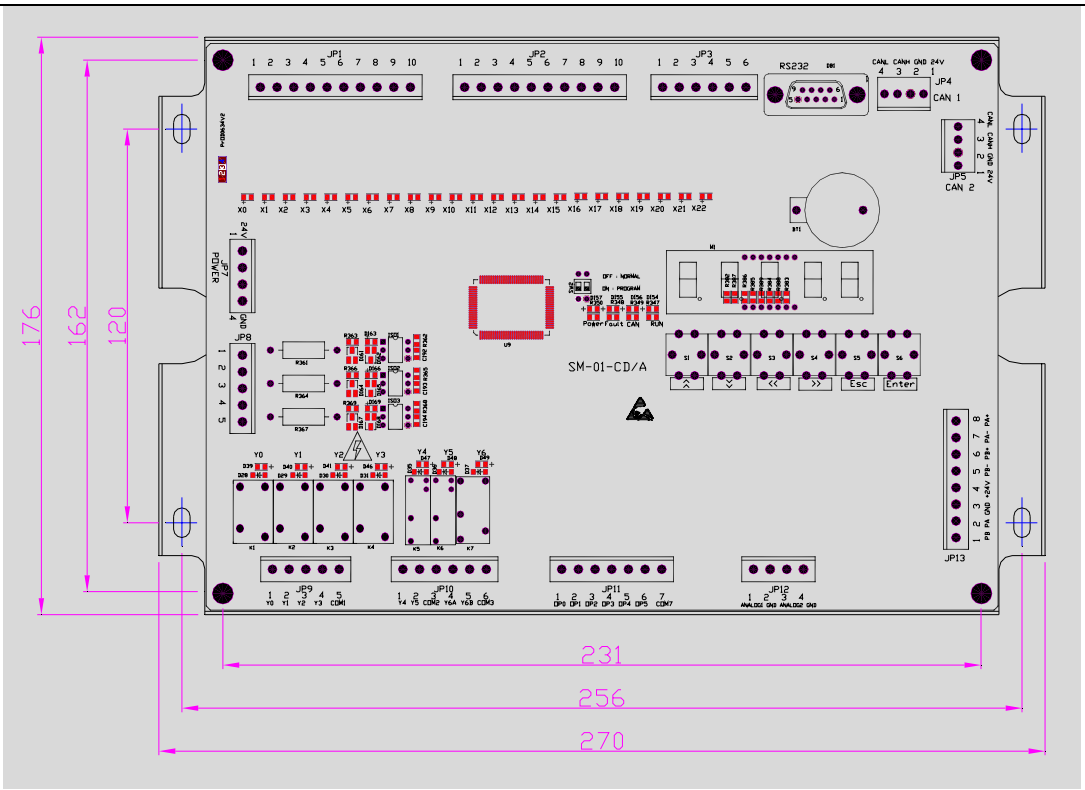


Fig. 2-2 (B) Mounting Dimensions of Master Control Board

2.3.1.2 The Definitions of Plug-ins and Terminals on Master Control Board

Master Control PCB			
Socket	Type	Socket	Type
JP1/JP2	DINKLE EK508V-10P	**JP12**	DINKLE EK508V-4P
JP3/JP10	DINKLE EK508V-6P	**JP17**	DINKLE EK508V-8P
JP4/JP5	CH3.96-4	**DB1**	RS232 9-pin vertical
JP7/JP10	DINKLE EK508V-6P		
JP8/JP9	DINKLE EK508V-5P		

List 2-2 Terminal Specification on Master Control Board

No.	Terminal	Name	Definitions	Usage	Notes
JP1	JP1.1	X0	Inspection signals, off for inspection, on for normal	Input	Note 1.
	JP1.2	X1	Up signals for inch-up by inspection and up direction switch by attendant	Input	Note 2.
	JP1.3	X2	Down signals for inch-down by inspection and down direction switch by attendant	Input	Note 2.
	JP1.4	X3	Up two floor deceleration switch	Input	Note 3.
	JP1.5	X4	Down two floor deceleration switch	Input	Note 3.
	JP1.6	X5	Up limit switch	Input	

	JP1.7	X6	Down limit switch	Input	
	JP1.8	X7	Up one floor deceleration switch	Input	
	JP1.9	X8	Down one floor deceleration switch	Input	
	JP1.10	X9	Up leveling switch	Input	
JP2	JP2.1	X10	Down leveling switch	Input	
	JP2.2	X11	Inverter error signal detection	Input	
	JP2.3	X12	Fire return switch	Input	
	JP2.4	X13	Safe loop relay detection	Input	
	JP2.5	X14	Door lock relay detection	Input	
	JP2.6	X15	Inverter line-in contactor detection	Input	
	JP2.7	X16	Inverter line-out contactor detection	Input	
	JP2.8	X17	Brake contactor detection	Input	
	JP2.9	X18	Brake Switch 1 Detection	input	
	JP2.10	X19	Inverter run signal detection	Input	
JP3	JP3.1	X20	Fireman Switch	Input	
	JP3.2	X21	Brake Switch 2 Detection	Input	
	JP3.3	X22	Motor temperature testing signal	Input	
	JP3.4		X0-X21 common terminal for input	Input	
	JP3.5		X0-X21 negative terminal of isolation circuit, 0V	Input	
	JP3.6		X0-X21 positive terminal of isolation circuit, 24V	Input	
JP4	JP4.1		24V		Twisted Pairs must be used for communication
	JP4.2		0V		
	JP4.3		Serial communication signal terminal for call and registration, TXA1+		
	JP4.4		Serial communication signal terminal for call and Registration, TXA1-		
JP5	JP5.1		24V		Twisted Pairs must be used for communication
	JP5.2		0V		
	JP5.3		Serial communication signal terminal for parallel control, TXA2+		
	JP5.4		Serial communication signal terminal for parallel control, TXA2-		
JP7	JP7.1		power supply 24V for master controller		
	JP7.2		power supply 24V for master controller		
	JP7.3		power supply 0V for master controller		
	JP7.4		power supply 0V for master controller		
JP8	JP8.1		common terminal for 110V, 0V interlinked with JP8.5		

	JP8.2	D163	Safe loop check positive voltage, line-in 110V		
	JP8.3	D166	Door lock check positive voltage, input voltage 110V		
	JP8.4	D169	Stand-by, input voltage 110V		
	JP8.5		common terminal for 110V, 0V interlinked with JP8.1		
JP9	JP9.1	Y0	brake contactor output	Output	
	JP9.2	Y1	brake excitation contactor output	Output	
	JP9.3	Y2	Inverter line-in contactor output	Output	
	JP9.4	Y3	Inverter line-out contactor output	Output	
	JP9.5	COM1	common terminal Y0-Y3 of output relay		
JP10	JP10.1	Y4	relay output of door opening	Output	
	JP10.2	Y5	relay output of door closing	Output	
	JP10.3	COM2	common terminal Y4-Y5 of output relay		
	JP10.4	Y6	Fire signal normally-open output	Output	
	JP10.5	Y7	Fire signal normally-close output	Output	
	JP10.6	COM3	common terminal Y6-Y7 of output relay		
JP11	JP11.1	Y10	Inverter up	Output	
	JP11.2	Y11	Inverter down	Output	
	JP11.3	Y12	traveling performance of Inverter	Output	
	JP11.4	Y13	terminal 1 for multi speed phase by Inverter	Output	Definition see Note 4
	JP11.5	Y14	terminal 2 for multi speed phase by Inverter	Output	
	JP11.6	Y15	terminal 3 for multi speed phase by Inverter	Output	
	JP11.7	COM4	common terminal Y10-Y15 of output		
JP12	JP12.1		analogical speed reference output to terminal for speed setting in Inverter, 0～10V	Output	
	JP12.2		Analogical signal 0V	Output	
	JP12.3		analogical load compensation output to terminal for torque compensation in Inverter, 0～10V	Output	
	JP12.4		Analogical signal 0V	Output	
JP13	JP13.1		Encoder Phase PB, open loop in collector or push-pull output, frequency 0-30KHz		
	JP13.2		Encoder Phase PA, open loop in collector or push-pull output, frequency 0-30KHz		
	JP13.3		power supply output, 0V		
	JP13.4		power supply output, +24V		
	JP13.5		differential encoder PB-		
	JP13.6		differential encoder PB+		
	JP13.7		differential encoder PA-		

	JP13.8		differential encoder PA+		
DB1	DB1.1	X			RS232 terminal for hand-held operator
	DB1.2	RXD			
	DB1.3	TXD			
	DB1.4	X			
	DB1.5	GND			
	DB1.6	X			
	DB1.7	X			
	DB1.8	X			
	DB1.9	+5V			
SW2	Working status selection of Master PCB, 1and 2 OFF together for normal; 1and 2 ON together for burn recording the program.				

List 2-3 Terminal Definition of Master Control Board

Notes:

1. Normal/inspection service switch signal, OFF for inspection service, ON for normal service. Default value OFF, subject to no change.
2. Up/down travel signal, during inspection service, ON for inching up or down; during attendant service ON for switch between up and down direction, subject to no change.
3. Speed-changing terminal switch for double floors up/down, must be made available when rated speed is 1.5 m/s and up by digital multi-stage speed control.
4. Code Definition of Multi- Speed(Corresponding output terminals Y13, Y14 and Y15 work in combination in the list below.)

Inverter in Use	Stop	Brake	Creeping	Inspection	Single Floor	Double Floors	Three Floors	Four Floors	Five Floors
YASKAWA (0)	**0**	**0**	**3**	**4**	**5**	**6**	**7**	**1**	**2**
SIEMENS (1)	**0**	**0**	**1**	**2**	**7**	**3**	**5**	**5**	**5**
KEB (2)	**0**	**5**	**2**	**4**	**5**	**6**	**3**	**3**	**3**
MICO (3)	**0**	**0**	**4**	**1**	**0x0C**	**0x14**	**2**	**2**	**2**
SIEI (4)	**0**	**0**	**3**	**4**	**5**	**6**	**7**	**1**	**2**
DIETZ (5)	**0**	**0**	**2**	**4**	**5**	**6**	**7**	**7**	**7**

2.3.2 Car Board

2.3.2.1 External and Mounting Dimensions of Car Board

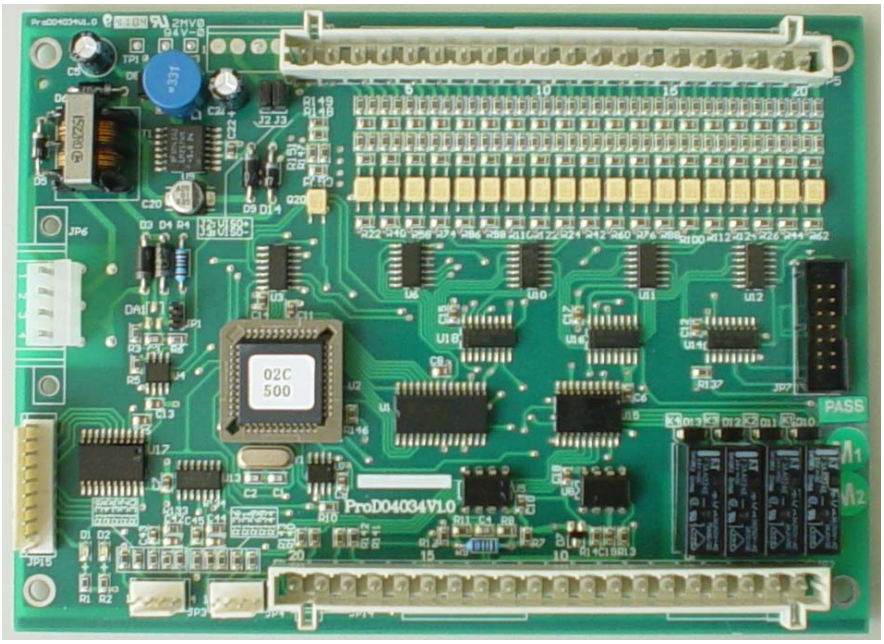


Fig. 2-3 (A) Outlook of Car Board

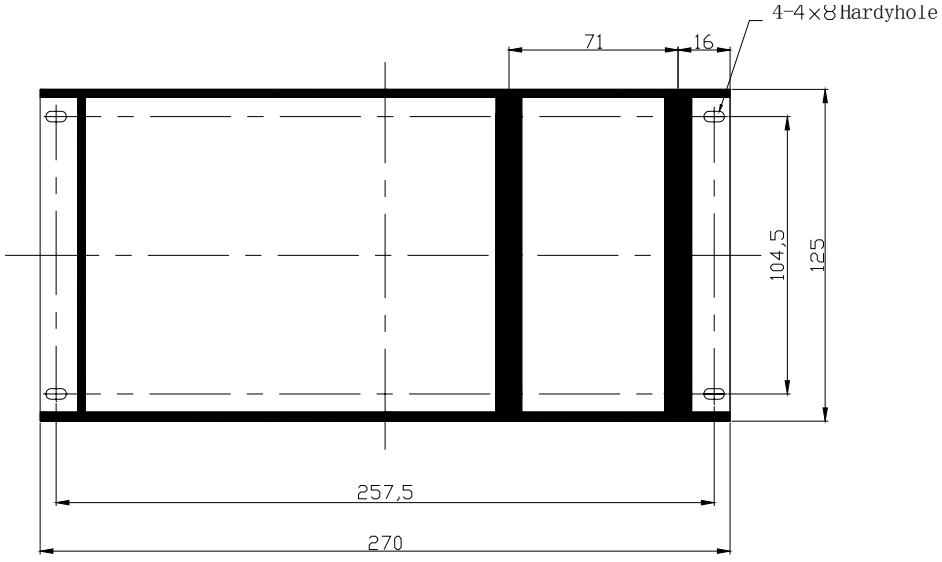


Fig. 2-3 (B) Mounting Dimensions of Car Board

2.3.2.2 Definitions of Plug-ins and Ports on Car Board

Car Board			
Socket	Type	Socket	Type
JP2/JP5	WAGO 20P	JP7	14-pin double-lined vertical
JP3/JP4	CH2510-4	JP15	CH2510-10
JP6	CH3.96-4		

List 2-4 Terminal Specification on Car Board

No.	Terminal	Name	Definitions	Usage	Notes
JP2	JP2.1	TY0	relay output of arrival gong upward	Output	
	JP2.2		common terminal TY0		
	JP2.3	TY1	relay output of arrival gong downward	Output	
	JP2.4		common terminal TY1		
	JP2.5	TY2	relay output of car lighting relay	Output	
	JP2.6		common terminal TY2		
	JP2.7	TY3	relay output of Nudging door-closing signal	Output	
	JP2.8		Common terminal TY3		
	JP2.9	TY4	Transistor output of Overload lamp-, output capacity 24V、20mA	Output	
	JP2.10	TY4	Overload lamp +	Output	
	JP2.11	TY5	Transistor output of buzzer-, output capacity 24V、20mA	Output	
	JP2.12	TY5	buzzer output +	Output	
	JP2.13		load analogy signal +	Input	
	JP2.14		load analogy signal -	Input	
	JP2.15	RS485A+	RS485 communication port +		
	JP2.16	RS485B-	RS485communication port -		
	JP2.17		stand-by		
	JP2.18		stand-by		
	JP2.19		Isolation power supply input +		
	JP2.20		Isolation power supply input -		
JP3	JP3.1		door-open indicator power supply -	Output	Note 2
	JP3.2		door-open indicator power supply +	Output	
	JP3.3	TX19	one terminal of door-open button	Input	
	JP3.4	TX19	the other terminal of door-open button	Input	
JP4	JP4.1		door-close indicator power supply -	Output	
	JP4.2		door-close indicator power supply +	Output	
	JP4.3	TX20	one terminal of door-close button	Input	
	JP4.4	TX20	the other terminal of door-close button	Input	
	JP5.1	COM	common terminal TX0-TX18, 0V		
	JP5.2	TX0	door-open limit switch (front)	Input	

JP5	JP5.3	TX1	door-close limit switch (front)	Input	
	JP5.4	TX2	safety edge switch(front)	Input	
	JP5.5	TX3	over-load switch		
	JP5.6	TX4	full-load switch	Input	
	JP5.7	TX5	stand-by	Input	
	JP5.8	TX6	stand-by	Input	
	JP5.9	TX7	light-load switch		
	JP5.10	TX8	Attendant	Input	
	JP5.11	TX9	VIP	Input	
	JP5.12	TX10	Attendant by-pass switch		
	JP5.13	TX11	stand-by	Input	
	JP5.14	TX12	stand-by	Input	
	JP5.15	TX13	stand-by	Input	
	JP5.16	TX14	Light gate for front door		
	JP5.17	TX15	stand-by	Input	
	JP5.18	TX16	stand-by	Input	
	JP5.19	TX17	stand-by	Input	
	JP5.20	TX18	stand-by	Input	
JP6	JP6.1	TXV+	power supply +24V in serial communication with car		CAN BUS
	JP6.2	TXV-	power supply 0V in serial communication with car		
	JP6.3	TXA+	positive signals in serial communication with car and call control etc.		
	JP6.4	TXA-	Negative signals in serial communication with car and call control etc.		
JP15	JP15.1		parallel voice port D0, LSB		Note 1
	JP15.2		parallel voice port D1		
	JP15.3		parallel voice port D2		
	JP15.4		parallel voice port D3		
	JP15.5		parallel voice port D4		
	JP15.6		parallel voice port D5		
	JP15.7		parallel voice port D6		
	JP15.8		parallel voice port D7,MSB		
	JP15.9		common terminal 0V		
	JP15.10		common terminal +24V		
JP1	Jumper for CAN serial communication port. DO NOT use it if the terminal resistor in car display is already bridged.				
JP7	for connecting car registration control PCB SM-03-D				
J2/J3	If the input power is supplied by JP6.1 and JP6.2, bridge J2 and J3. But if it is supplied by JP2.19 and JP2.20, DO NOT make any bridge!				

List 2-5 Terminal Definition of Car Board

Notes:

1．SM-02-D outputs eight-bit binary coding pulse signals, triggering voice landing forecast during deceleration of car for stop, one second for every pulse output. The eight-bit output is in the mode of transistors with open loop in the collector and shared anode, output voltage DC24V, current capacity 50mA. The 8-bit binary coding provides as many as 256 output status in accordance with STEP WORD BANK for display. If the user sets B1 in display for the 1st floor with its corresponding code 60 which is turned into binary code for output on JP15. The voice landing forecast B1 is made available by decoding the binary code. At present 0-247 are processed by the definition of the word bank for display （see the List of Display Codes in 2.3.4.7）whereas the codes of 248-255 are defined as following:

(248) 11111000： The signal comes out when the lift is at the main landing with the door closed for calls of going up.

(249) 11111001： The signal comes out when the lift is in fire alarm service.

(250) 11111010： The signal appears when the door-closing position limit switch turns from OFF to ON status during the door-opening.

(251) 11111011： The signal appears when the door-opening position limit switch turns from OFF to ON status during the door-closing.

(252) 11111100： Over-load alarm.

(253) 11111101： Voice landing forecast for going up when the door is fully open.

(254) 11111110： Voice landing forecast for going down when the door is fully open.

(255) 11111111： Undefined.

2．Wiring and Connection

□ The car control with power supply and CAN BUS is lined in from JP6, of which JP6.01 and JP6.02 are for TXV+ and TXV-，JP6.03 and JP6.04 for TXA+ and TXA- respectively. TXV+, TXV- are power input DC24V; TXA+ and TXA- are communication lines which must be **4-wire Twisted Pairs**.

□ The car control with input signals which are transferred to master control via CAN BUS as the car control collects most of the switch-generated data signals from inside the car and both on top and bottom of the car such as the inputs of door-opening and -closing, in-position signals for door-opening and –closing, safety edge, attendant, by-passing, full-load and over-load etc.

□ The output signals generated by relays and transistors from car control are transferred under the control signals from the master control via CAN BUS, of which the output signals by relays take control of the relays of arrival gongs and car-lighting etc. for landing forecasting and energy-saving in lighting, whereas the output signals from transistors are responsible for the control of the over-load lighting, alarm buzzer and door-open/close indicators etc.

□ The connection between car control and registration extension control is made ready in the car by means of plug-ins.

□ The door-open/close button indicators is shown as follows, i.e., Pin 1 and Pin 2 to the positive and negative of power supply respectively, whereas Pin 3 and Pin 4 to the terminals of the button.

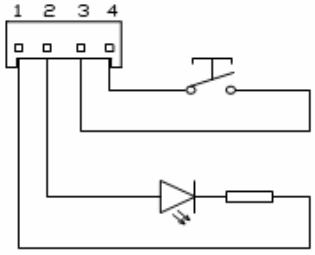


Fig. 2-4 Connection of Door Open/Close Buttons & Indicators

2.3.3 Car Call Board

2.3.3.1 External and Mounting Dimensions of Car Call Board

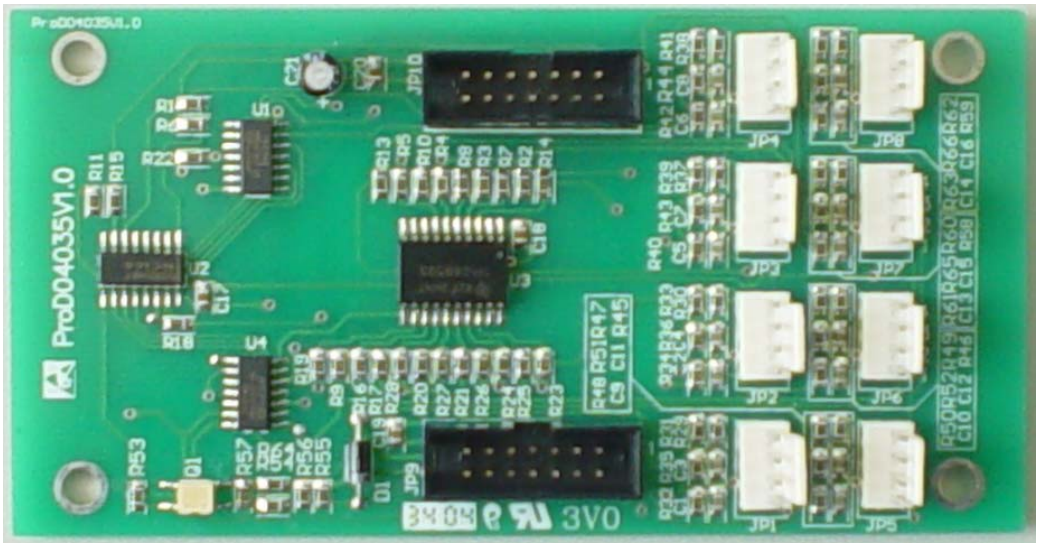


Fig. 2-5 (A) Outlook of Car Call Board

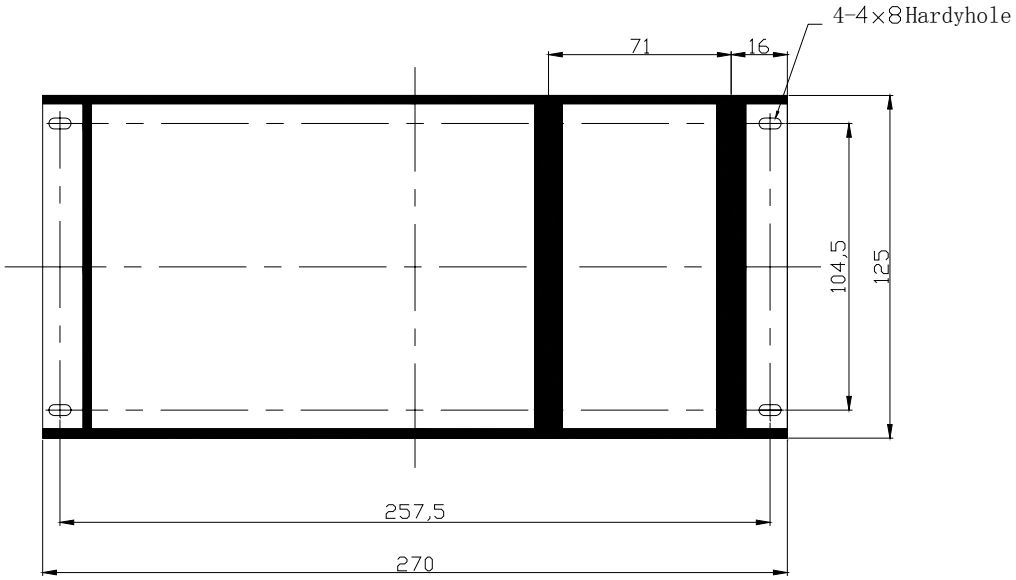


Fig. 2-5 (B) Mounting Dimensions of Car Call Board

2.3.3.2 The Plug-ins and Ports on Car Call Board

Car Call Board	
Socket	Type
JP1/JP2/JP3/JP4/JP5/JP6/JP7/JP8	CH2510-4
JP9/JP10	14-pin double-lined vertical

List 2-7 Terminal Specification on Car Call Board

No.	Terminal Definition of Car Call Board	Terminal Definition of Car Call Board	Terminal Definition of Car Call Board 3#	Terminal Definition of Car Call Board 4#
JP1	to button of 1st Fl.	to button of 9th Fl.	to button of 17th Fl.	to button of 25th Fl
JP2	to button of 2nd Fl.	to button of 10th Fl.	to button of 18th Fl.	to button of 26h Fl
JP3	to button of 3rd Fl.	to button of 11th Fl.	to button of 19th Fl.	to button of 27th Fl
JP4	to button of 4th Fl.	to button of 12th Fl.	to button of 20th Fl.	to button of 28th Fl
JP5	to button of 5th Fl.	to button of 13th Fl.	to button of 21th Fl.	to button of 29th Fl
JP6	to button of 6th Fl.	to button of 14th Fl.	to button of 22th Fl.	to button of 30th Fl
JP7	to button of 7th Fl.	to button of 15th Fl.	to button of 23th Fl.	to button of 31st Fl
JP8	to button of 8th Fl.	to button of 16th Fl.	to button of 24th Fl.	to button of 32nd Fl

List 2-8 Terminal Definition of Car Call Board

Notes:

Wiring of the door-open/close button indicators is shown as follows, i.e., Pin 1 and Pin 2 to the positive and negative of power supply respectively, whereas Pin 3 and Pin 4 to the terminals of the button.

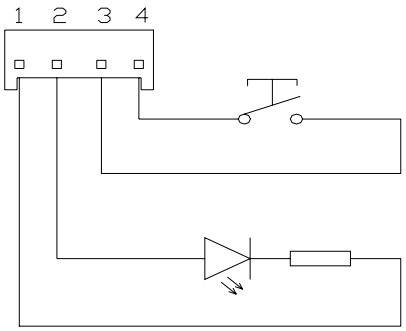


Fig. 2-6 Connection of Door Open/Close Buttons & Indicators

2.3.4 Landing Call & Display Control Board

2.3.4.1 Display Control Board SM-04-VRF

☆ Outlook & Mounting Dimensions of SM-04-VRF

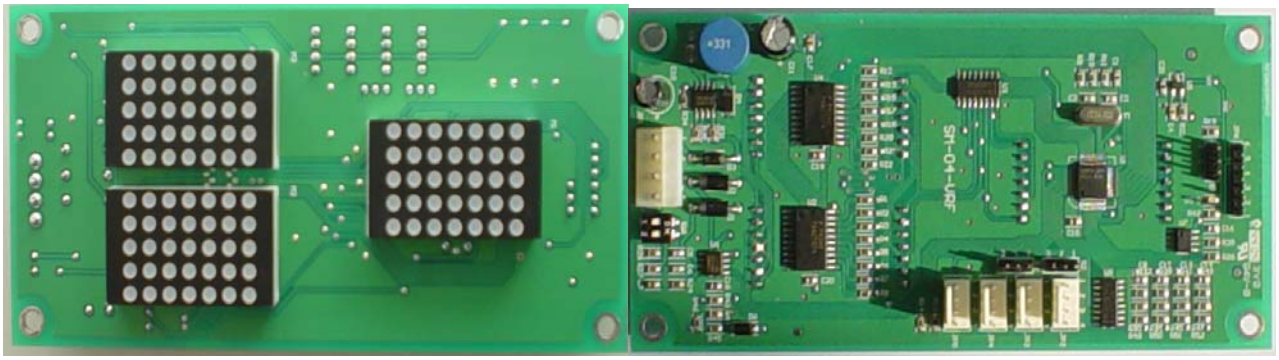


Fig. 2-7 (A) Outlook of SM-04-VRF

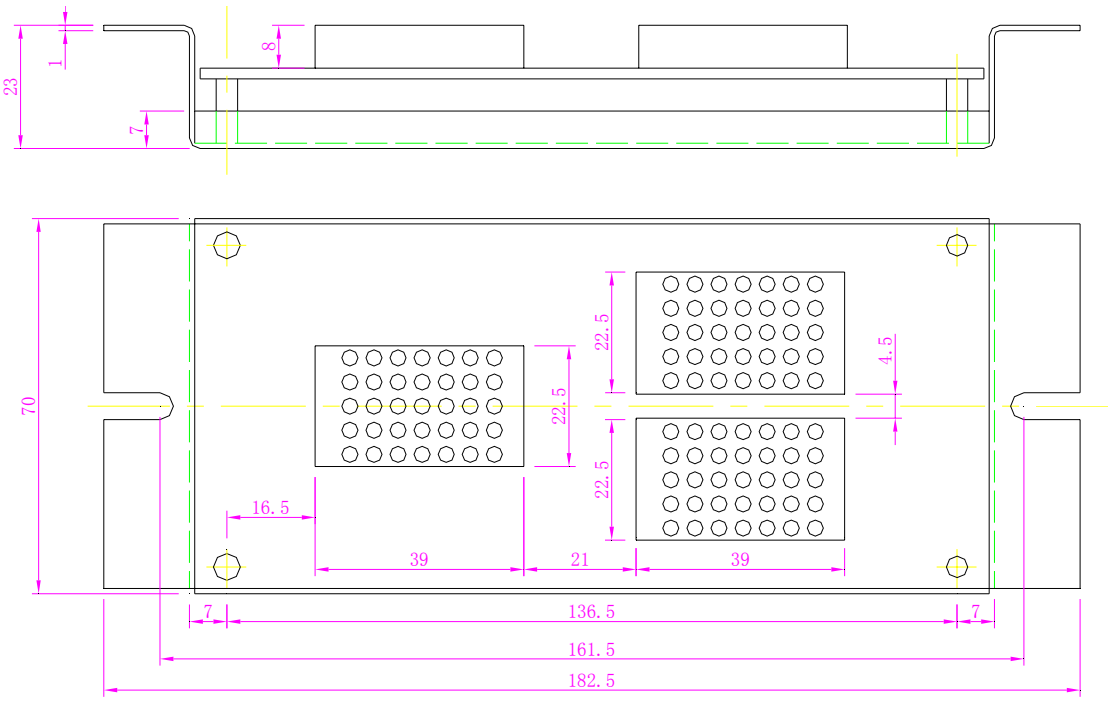


Fig. 2-7 (B) Mounting Dimensions of SM-04-VRF

☆ Terminal Definition and Plug-in Specification on SM-04-VRF

Serial	Descriptions	Remarks
JP1	Serial port, of which Pin 1 for TXV+, Pin 2 for TXV-, Pin 3 for TXA+ and Pin 4 for TXA- respectively.	CH3.96-4
JP2	Up-call terminals , of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP3	Down-call terminals, of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP4	Stop indicator(Landing)/Over load indicator(In-Car) and lockout terminals, of which Pin 1- and Pin 2+ for stop/over load indicator; Pin 3 and Pin 4 for the input of default open contact of the lockout switch.	CH2510-4
JP5	Output terminals for full-load indicator(Landing)/fire indicator(In-Car), of which Pin 1- and Pin 2+ for full-load/fire indicator; Pin 3 and Pin 4 for stand-by.	CH2510-4
JP6	RS232 port for program burn recording.	
S1	Set the address codes of the display Board with the jumper on, after that the jumper MUST BE REMOVED.	
SW1	Resistor jumper for serial communication terminals for connecting the 120Ω built-in resistor when jumpers are put on together.	

List 2-9 Terminal Definition and Specification of SM-04-VRF

2.3.4.2 Display Control Board SM-04-VSC

☆ Outlook & Mounting Dimensions of SM-04-VSC

Fig. 2-8 (A) Outlook of SM-04-VSC

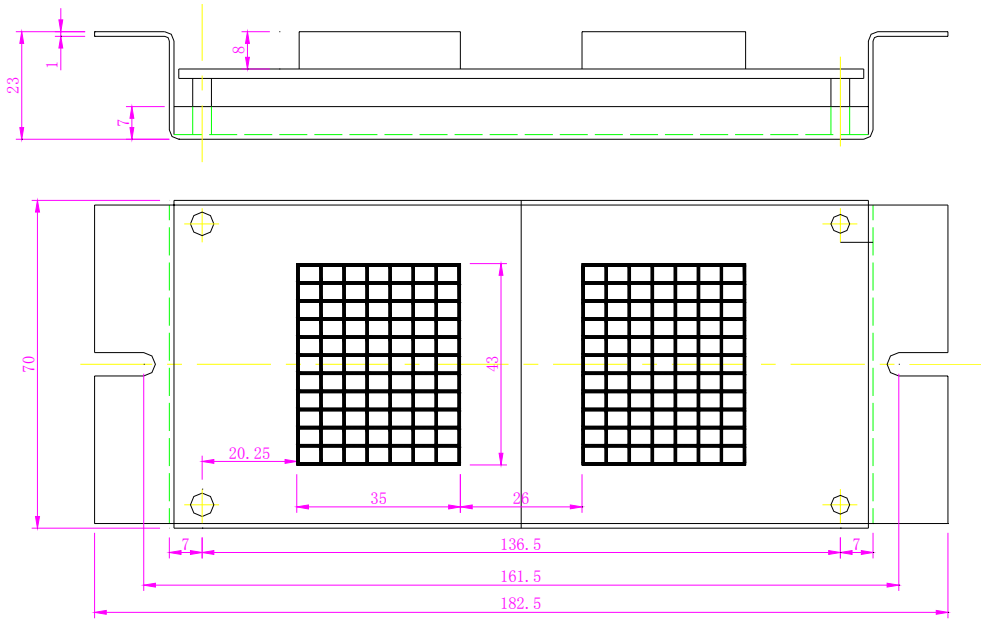


Fig. 2-8 (B) Mounting Dimensions of SM-04-VSC

☆ Terminal Definition and Plug-in Specification on SM-04-VSC

Serial	Descriptions	Remarks
JP1	Serial port, of which Pin 1 for TXV+, Pin 2 for TXV-, Pin 3 for TXA+ and Pin 4 for TXA- respectively.	CH3.96-4
JP2	RS232 port for program burn recording.	CH2510-4
JP3	Up-call terminals, of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP4	Down-call terminals, of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP5	Stop indicator (Landing)/Over load indicator(In-Car) and lockout terminals, of which Pin 1- and Pin 2+ for stop/over load indicator; Pin 3 and Pin 4 for the input of default open contact of the lockout switch.	CH2510-4
JP6	Output terminals for full-load indicator (Landing)/fire indicator(In-Car), of which Pin 1- and Pin 2+ for full-load/fire indicator; Pin 3 and Pin 4 for stand-by.	
S1	Set the address codes of the display Board with the jumper on, after that the jumper MUST BE REMOVED.	
J1/J2	Resistor jumper for serial communication terminals for connecting the 120Ω built-in resistor when jumpers are put on together.	

List 2-10 Terminal Definition and Specification of SM-04-VSC

2.3.4.3 Display Control Board SM-04-HRC

☆ Outlook & Mounting Dimensions of SM-04-HRC

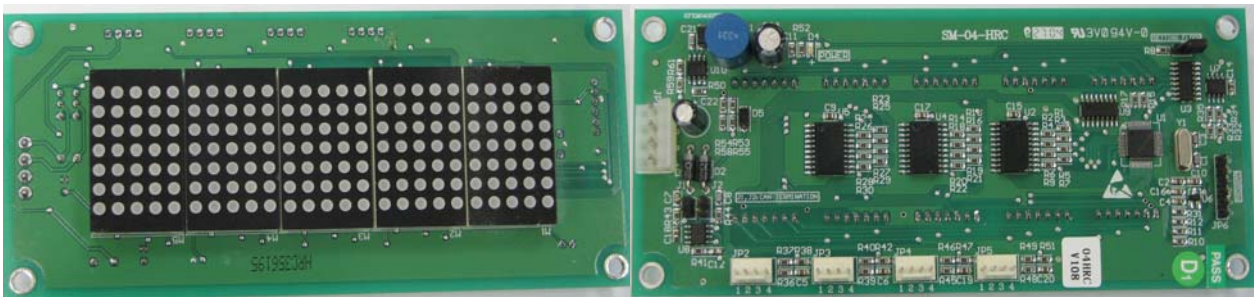


Fig. 2-9 (A) Outlook of SM-04-HRC

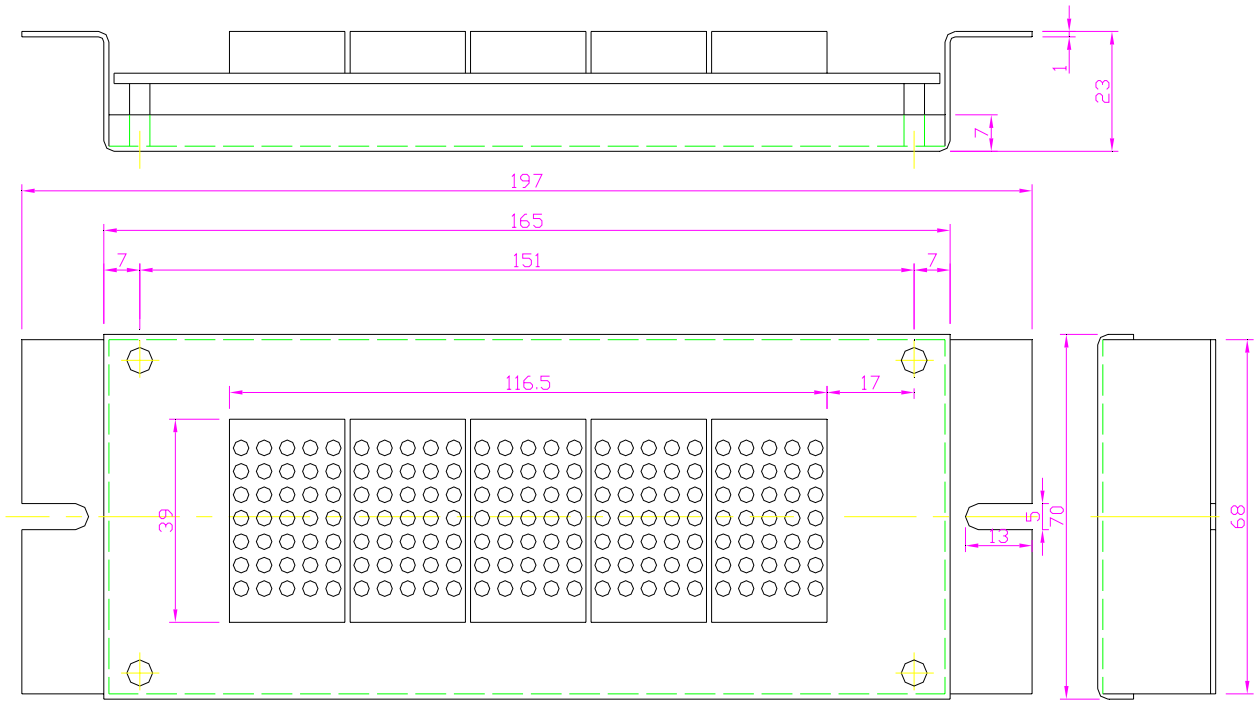


Fig. 2-9 (B) Mounting Dimensions of SM-04-HRC

☆ Terminal Definition and Plug-in Specification on SM-04-HRC

Serial	Descriptions	Remarks
JP1	Serial port, of which Pin 1 for TXV+, Pin 2 for TXV-, Pin 3 for TXA+ and Pin 4 for TXA- respectively.	CH3.96-4
JP2	Up-call terminals , of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP3	Down-call terminals , of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP4	Stop indicator(Landing)/Over load indicator(In-Car) and lockout terminals, of which Pin 1- and Pin 2+ for stop/over load indicator; Pin 3 and Pin 4 for the input of default open contact of the lockout switch.	CH2510-4
JP5	Output terminals for full-load indicator(Landing)/fire indicator(In-Car), of which Pin 1- and Pin 2+ for full-load/fire indicator; Pin 3 and Pin 4 for stand-by.	CH2510-4
JP6	RS232 port for program burn recording.	2.54*6–pin single-lined
S1	Set the address codes of the display Board with the jumper on, after that the jumper MUST BE REMOVED.	
J1/J2	Resistor jumper for serial communication terminals for connecting the 120Ω built-in resistor when jumpers are put on together.	

List 2-11 Terminal Definition and Specification of SM-04-HRC

2.3.4.4 Display Control Board SM-04-HSC

☆ Outlook & Mounting Dimensions of SM-04-HSC

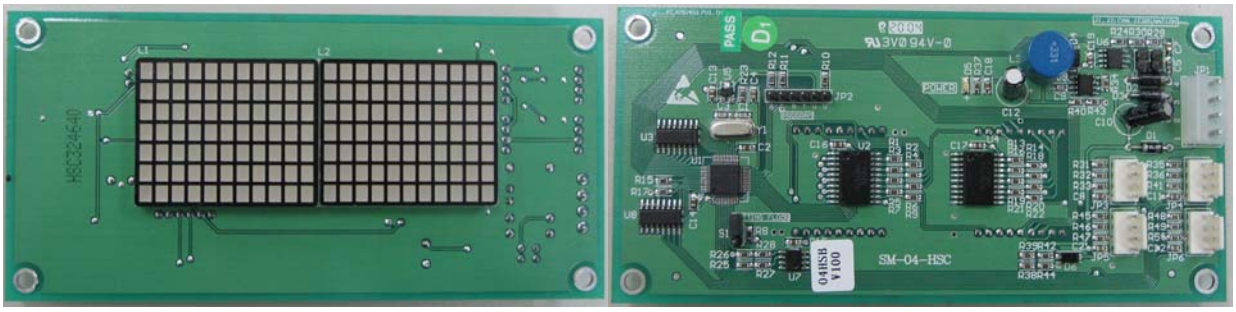


Fig. 2-10 (A) Outlook of SM-04-HSC

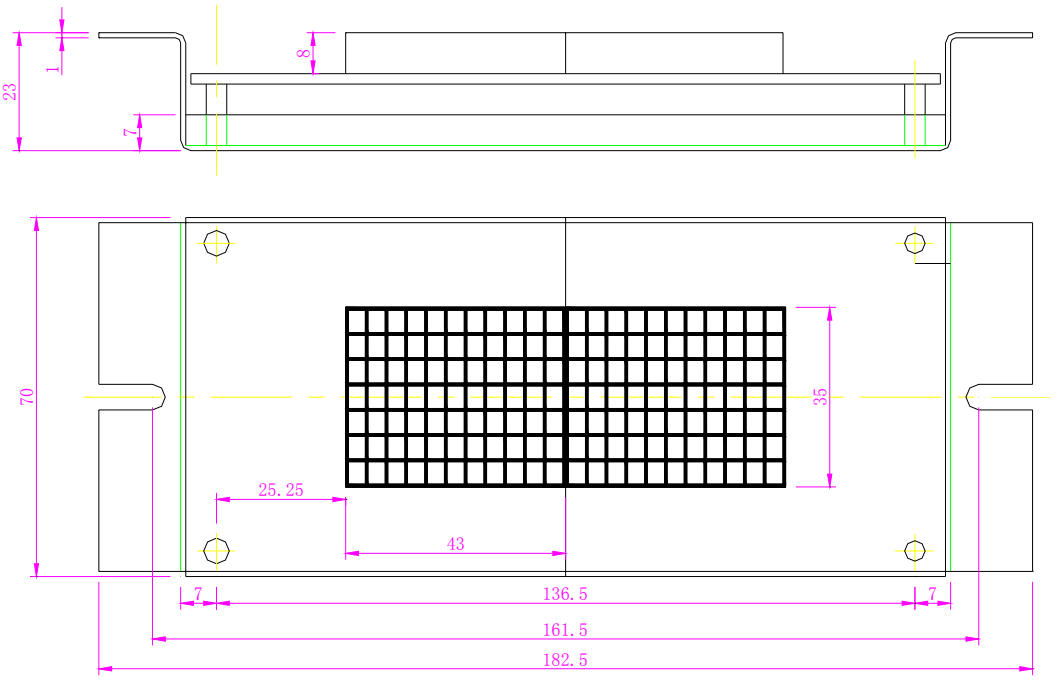


Fig. 2-10 (B) Mounting Dimensions of SM-04-HSC

☆ Terminal Definition and Plug-in Specification on SM-04-HSC

Serial	Descriptions	Remarks
JP1	Serial port, of which Pin 1 for TXV+, Pin 2 for TXV-, Pin 3 for TXA+ and Pin 4 for TXA- respectively.	CH3.96-4
JP2	RS232 port for program burn recording.	
JP3	Up-call terminals , of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP4	Down-call terminals, of which Pin 1- and Pin 2+ for button indicator, Pin 3 and Pin 4 for button input.	CH2510-4
JP5	Stop indicator(Landing)/Over load indicator(In-Car) and lockout terminals, of which Pin 1- and Pin 2+ for stop/over load indicator; Pin 3 and Pin 4 for the input of default open contact of the lockout switch.	CH2510-4
JP6	Output terminals for full-load indicator(Landing)/fire indicator(In-Car), of which Pin 1- and Pin 2+ for full-load/fire indicator; Pin 3 and Pin 4 for stand-by.	CH2510-4
S1	Set the address codes of the display Board with the jumper on, after that the jumper MUST BE REMOVED.	
J1/J2	Resistor jumper for serial communication terminals for connecting the 120Ω built-in resistor when jumpers are put on together.	

List 2-12 Terminal Definition and Specification of SM-04-HSC

2.3.4.5 Display Control Board SM-04-VHL

☆ Outlook & Mounting Dimensions of SM-04-VHL

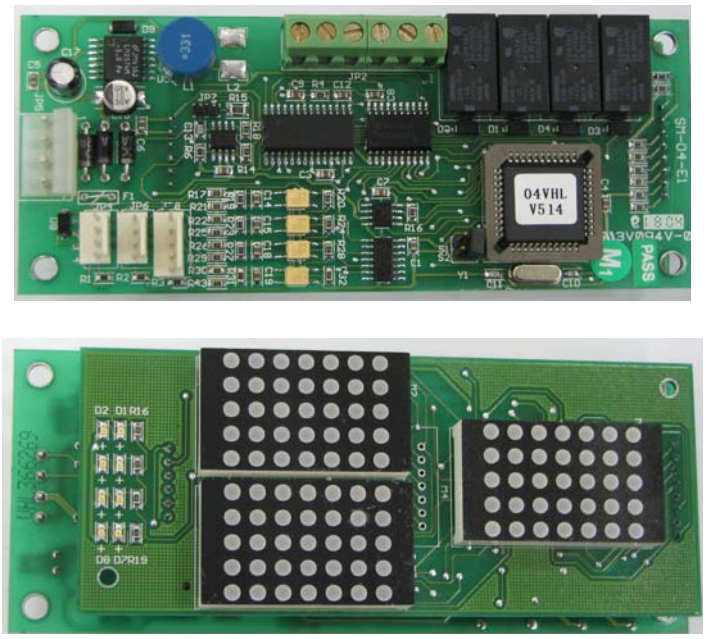
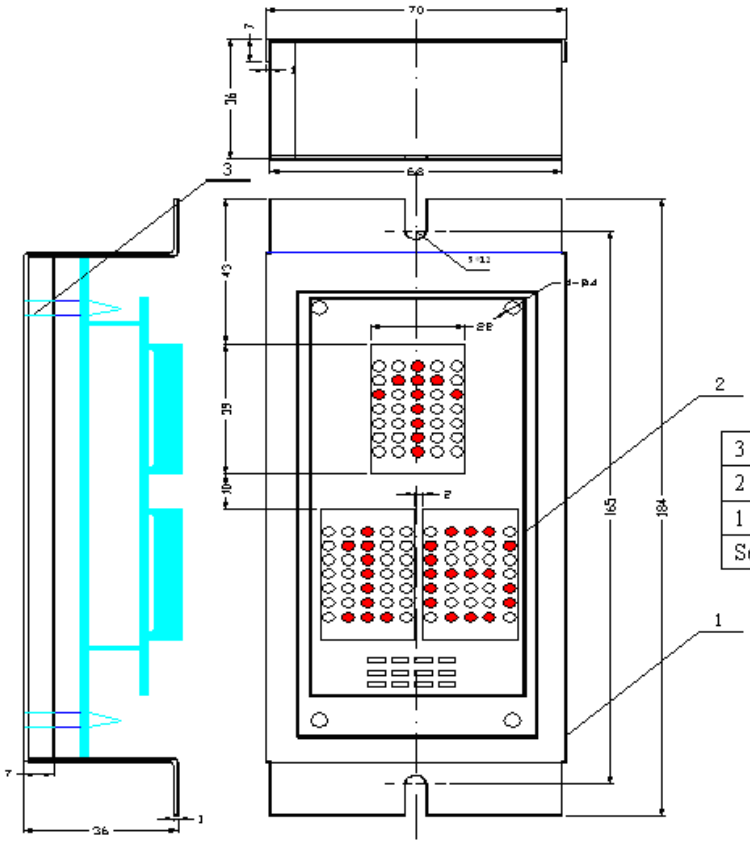


Fig. 2-11 (A) Outlook of SM-04-VHL



3	Nylon fixed nail	Fixed in the factory
2	SM-04 PCB	
1	SM-04 fixed board	
Serial	Description	Remarks

Fig. 2-11 (B) Mounting Dimensions of SM-04-VHL

☆ Terminal Definition and Plug-in Specification on SM-04-VHL

Serial	Descriptions		Remarks
JP5	Serial port, of which Pin 1 for TXV+, Pin 2 for TXV-, Pin 3 for TXA+ and Pin 4 for TXA- respectively.		CH3.96-4
JP4	Down-call terminals, of which Pin 3+ and Pin 4- for button indicator, Pin 1 and Pin 2 for button input.		CH2510-4
JP6	Up-call terminals, of which Pin 3+ and Pin 4- for button indicator, Pin 1 and Pin 2 for button input.		CH2510-4
JP8	Pin 1 and Pin 2 JP8 for the input of default open contact of the lockout switch, Pin 3 and Pin 4 for stand-by.		CH2510-5
JP2	JP2.1	output terminal for landing arrival gong up	CH2510-4
	JP2.2	common terminal for landing arrival gongs up and down	
	JP2.3	output terminal for landing arrival gong down	
	JP2.4	output terminal for landing arrival gong up	
	JP2.5	common terminal for landing arrival gongs up and down	
	JP2.6	output terminal for landing arrival gong down	
JP7	Resistor jumper for serial communication terminals for connecting the 120Ω built-in resistor when jumpers are put on together.		
S1	Set the address codes of the display Board with the jumper on, after that the jumper MUST BE REMOVED.		
S2	Inserting the jumper on the landing call display Board of the lift locked out shows the lockout input on this Board in effect. Only ONE of the display Boards of the lift shall be jumped to S2.		

List 2-13 Terminal Definition and Specification of SM-04-VHL

2.3.4.6 Display Control Board SM-04-UL

☆ Outlook & Mounting Dimensions of SM-04-UL

Fig. 2-12 (A) Outlook of SM-04-UL

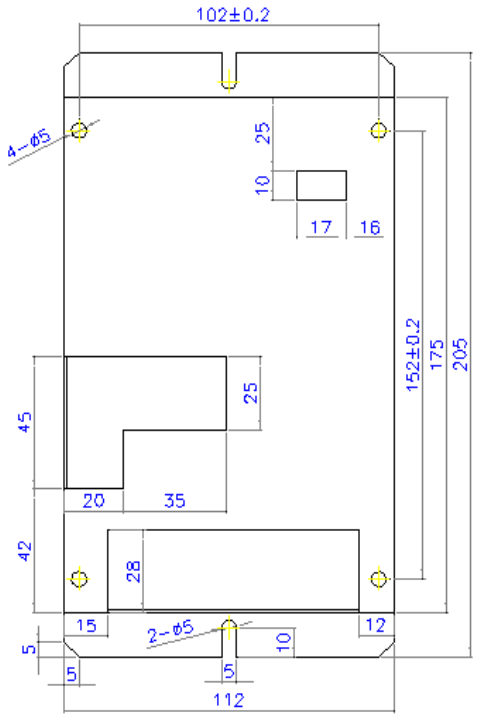


Fig. 2-12 (B) Mounting Dimensions of SM-04-UL

☆ Terminal Definition and Plug-in Specification on SM-04-UL

Serial	Descriptions	Remarks
JP8	Serial port, of which Pin 1 for TXV+, Pin 2 for TXV-, Pin 3 for TXA+ and Pin 4 for TXA- respectively.	CH3.96-4
JP11	Down-call terminals, of which Pin 3+ and Pin 4- for button indicator, Pin 1 and Pin 2 for button input.	CH2510-4
JP12	Up-call terminals, of which Pin 3+ and Pin 4- for button indicator, Pin 1 and Pin 2 for button input.	CH2510-4
JP10	Pin 3 and Pin 4 for the input of default open contact of the lockout switch, Pin 1 and Pin 2 for stand-by.	CH2510-5
SW1	Resistor jumper for serial communication terminals for connecting the 120Ω built-in resistor when jumpers are put on together. Both ON for connection of CAN terminal resistor, both OFF for disconnection of it.	
SW2	SW2.1 ON for setting number of passengers allowed boarding in car by pressing on up and down buttons, OFF for normal. SW2.2 ON for display in English, OFF for display in Chinese.	

SW5	SW5.1 ON for setting address codes by pressing on up and down buttons, OFF for normal. SW5.2 ON for selecting time options by pressing on up button, for changing in time by pressing on down button, OFF for normal. Both SW2.1 and SW5.1 ON before power-on for adjusting display contrast by pressing on up and buttons.	

List 2-14 Terminal Definition and Specification of SM-04-UL

☆ A Guide to Settings

Address Codes	SW5.1 ON, press on up and down call buttons.		Range of Codes	0 to 48
Time Setting	SW5.2 ON, press on up call button to select time options, press on down call button to make changes in time.			
Passengers Allowed Entry in Car	SW2.1 ON, press on up and down call buttons to set the number of passengers allowed boarding in car.			
Display Contrast Adjustment	in hardware	Adjust the value of resistance in R53 by turning a screwdriver while watching the change in contrast. It allows for a wide range in adjustment.		
	in software	Set both SW2.1 and SW5.1 ON before switch on power and adjust the display contrast by pressing on up and down call buttons, only good for fine adjustment.		
Language Setting	SW2.2 ON for display in English, OFF for display in Chinese.			

2.3.4.7 Miscellaneous (A List of Display Codes)

☆ A List of Performance Displays

Displays in Car				No Voice Forecast
Inspection	☑ Normal	☐ No	☐ Special symbol/otherwise	
Re-leveling at power off	☑ Normal	☐ No	☐ Special symbol/otherwise	
Independent	☑ Normal	☐ No	☐ Special symbol/otherwise	
Fireman	☑ Normal	☐ No	☐ Special symbol/otherwise	
Safety circuit off	☑ Normal	☐ No	☐ Special symbol/otherwise	
Lockout	☑ Normal	☐ No	☐ Special symbol/otherwise	
Breakdown	☑ Normal	☐ No	☐ Special symbol/otherwise	
Overload	☐ Normal	☐ No	☑ Special symbol/otherwise	“oL” on display
By-pass with attendant	☑ Normal	☐ No	☐ Special symbol/otherwise	
Full-load	☑ Normal	☐ No	☐ Special symbol/otherwise	

Displays in the Landing				No Voice Forecast
Inspection	☐ Normal	☑ No	☐ Special symbol/otherwise	
Re-leveling at power off	☐ Normal	☑ No	☐ Special symbol/otherwise	
Independent	☐ Normal	☑ No	☐ Special symbol/otherwise	
Fireman	☐ Normal	☑ No	☐ Special symbol/otherwise	
Safety circuit off	☐ Normal	☑ No	☐ Special symbol/otherwise	

Lockout	☐ Normal	☑ No	☐ Special symbol/otherwise	
Breakdown	☐ Normal	☑ No	☐ Special symbol/otherwise	
Overload	☑ Normal	☐ No	☐ Special symbol/otherwise	
By-pass with attendant	☐ Normal	☐ No	☑ Special symbol/otherwise	1[F]，2/3 Normal
Full-load	☐ Normal	☐ No	☑ Special symbol/otherwise	1[F]，2/3 Normal

☆ A List of Display Codes (by Standard STEP Word Bank)

Display code list															
Code	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Display	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Code	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Display	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Code	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Display	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Code	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
Display	45	46	47	48		-1	-2	-3	-4	-5	-6	-7	-8	-9	
Code	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Display	B1	B2	B3	B4	B5	B6	B7	B8	B9	B	G	M	M1	M2	M3
Code	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
Display	P	P1	P2	P3	R	R1	R2	R3	L	H	H1	H2	H3	3A	12A
Code	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
Display	12B	13A	17A	17B	5A	G1	G2	G3	F	出口	C1	C2	C3	C4	C
Code	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
Display	D1	D2	D3	D4	D	1F	2F	3F	4F	5F	1C	2C	3C	4C	
Code	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134
Display	1B	2B	3B	4B	1A	2A	4A	CF	LB	E	A	UB	LG	UG	6A
Code	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149
Display	6B	7A	7B	5B	6C				SB	15A	13B	K	U	S	EG
Code	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164
Display	KG	KE1	KE2	KE3	KE4	KE5	KE6	KE7	KE8	KE9	GF	MZ	SR	19A	Z
Code	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
Display	HP	AB	PH	AA	L1	L2	L3	PB	-10	AG	BE	RF	1L	5L	1M
Code	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194
Display	3M	4M	B1A	B2A	B3A	B4A	PM	14A	14B	AS	15B	16A	16B	22A	22B
Code	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209
Display	E1	E2	S1	S2	S3	E3	E4	49	50	51	52	53	54	55	56
Code	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224
Display	57	58	59	60	61	62	63	64	P4	P5	LD	JC	S4	S5	SS
Code	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Display	LL	5C	9F	LF	UF	FF	33A	S6	S8	LP	UP	MR	PC	P6	P7
Code	240	241	242	243	244	245	246	247							
Display	P8	P9	P10	P3A	P7A	P8A	P9A	AF							

☐ The definitions and display symbols of the terminals may vary with the edition. The above listing is the one based on the standard edition.

☆ Wiring and Connection

1. The connection of the display Board for power supply and communication is shown in Fig. 2-13(B), the power supply and communication is made available via a 4-pin plug, of which Pin 1 for TXV+, Pin 2 for TXV-, both with DC24V power supply; Pin3 for TXA+ and Pin 4 for TXA- are communication lines. The lines for communication must be **4-wire Twisted Pairs**.
2. The connection between the display Board and the landing push button is shown in Fig. 2-13(A), i.e., Pin 1 and Pin 2 for push-button indicator, whereas Pin 3 and Pin 4 for the push button.

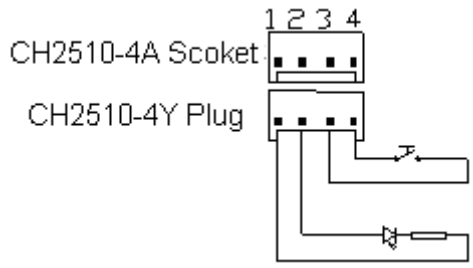


Fig. 2-13 (A) Connection of the Push Button

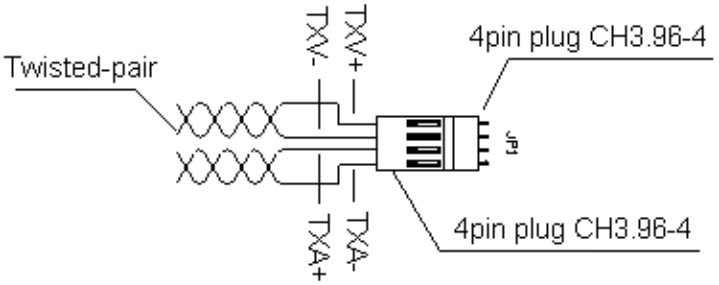


Fig. 2-13 (B) Connection of Communication Lines

Chapter III On Parameters

3.1 A List of Parameters

Paranumber	Parameter Description	Defaul	Range	Unit	Reference
F00	Adjust starting acceleration	550	200-1500	mm/s^2	$0.55m/ s^2$
F01	Adjust braking deceleration	550	200-1500	mm/s^2	$0.55m/ s^2$
F02	S Jerk T0（S curve jerk start at start T0）	1300	300-3000	ms	1.300s
F03	S Jerk T1（S curve jerk at end of acceleration T1）	1100	300-2000	ms	1.100s
F04	S Jerk T2（S curve jerk at start of deceleration T2）	1100	300-2000	ms	1.100s
F05	S Jerk T3（S curve jerk at end of deceleration T3）	1300	30-3000	ms	1.300s
F06	Rated speed	1750	200-6000	mm/s	1.75m/s
F07	Rated rotations of motor	1450	50-10000	rpm	1450rpm
F08	Encoder Pulses	1024	100-1000	ppr	1024ppr
F09	Locked home landing	1	1-64		
F10	Floor offset	0	0-20		
F11	No. of Floor	18	2-64		
F12	Inspection Speed	250	0-500	mm/s	0.25m/s
F13	Relevelling Speed	60	10-150	mm/s	0.06m/s
F14	Door-closing delay for calls	30	0-300	0.1s	3.0s
F15	Door-closing delay for registrations	30	0-300	0.1s	3.0s
F16	Brake delay	2	0-20	0.1s	0.2s
F17	Operation removal delay	6	2-30	0.1s	0.6s
F18	Fire home	1	0-64		
F19	Second fire home（Not used yet）	1	0-64		
F20	Homing Delay	0	0-60	s	
F21	Level adjust distance（Tolerance in distance for single-floor and multi-floor leveling）	6	0-40	mm	6mm
F22	1^{st} main landing for duplex control	1	0-64		
F23	duplex mode	3	1-3		
F24	Drive mode (0 for digital;1 for analogy; 2 for analogy with creep）	1	0-2		
F25	Input Type 1（X0-X15 Input N/O,N/C setup）	481	0-65535		
F26	Input Type 2（X16-X31 Input N/O,N/C setup）	4	0-65535		
F27	Input Type 3（TX0-TX15 Input N/O,N/C setup）	4255	0-65535		

F28	Input Type 4（TX16-TX31 Input N/O,N/C setup）	0	0-65535		
F29	Service floor setting 1（whether stop on Fl. 1-16）	65535	0-65535		
F30	Service floor setting 2（whether stop on Fl. 17-32）	65535	0-65535		
F31	Service floor setting 3（whether stop on Fl. 33-48）	65535	0-65535		
F190	Service floor setting 4（whether stop on Fl. 49-64）	65535	0-65535		
F32	Inverter type selection in Digital control	0	0-20		
F33	Interval between trips in automatic running test	5	0-60	s	5s
F34	Number of trips in automatic running test	0	0-65535		
F35	Fireman mode	0	0-3		
F36	Brake switch detection mode	0	0-65535		
F37-F42	Stand-by				
F43	Buzzer & flashing at landing call by attendant service	3	0-255		
F44	Local address for serial communication（255 without monitoring）	255	0-255		
F45	Deceleration distance for single Fl.	1300	0-65535	mm	1.300m
F46	Deceleration distance for double Fl.	2500	0-65535	mm	2.500m
F47-F49	Stand-by				
F50	Front door-opening allowed 1 for Fl.1-16	65535	0-65535		
F51	Front door-opening allowed 2 for Fl.17-32	65535	0-65535		
F56	Leveling adjustment up（50 for baseline）	50	0-65535	mm	50mm
F57	Leveling adjustment down（50 for baseline）	50	0-65535	mm	50mm
F58	Speed curve delay at start	5	0-250	0.1s	0.5s
F59	Stand-by				
F60	KMC testing mode (the 1st contactor)	0	0-65535		
F61	Distance for triggering arrival gong	1200	0-65535	mm	1.200m
F62	Time limit for anti-slippage operation	32	20-45	s	32s
F63	Setting the step of multi-speed (number from 1 to 5)	3	0-65535		
F64	Stand-by				
F65-F112	Indication of floors		0-65535		
F113-F116	Stand-by				
F120	Number of registrations for anti-nuisance	0	0-65535		

F122	Release direction delay during inspection service	3	0-65535	0.1s	0.3s
F123-F129	Stand-by				
F130	Holding door-opening/closing torque	0	0-65535		
F131-F151	Stand-by				
F152	Delay for car-lighting before automatically switching off car-lighting and fan	5	0-65535	60s	300s
F153-F155	Stand-by				
F156	Door lock and safe loop relay check enable	0	0-65535		
F157-F163	Stand-by				
F164	Load-weighing signal	0	0-65535		
F165	Door open selection in testing traveling	0	0-65535		
F166-F174	Stand-by				
F175	Creeping speed at start	6	0-65535	mm/s	0.006m/s
……					
F180	Velocity increment	1000	0-65535	‰	100.0%
F181	Lift numbering in duplex control	0	0-65535		
F182	Steps of speed reduction switches	1	0-65535		
F183	Speed at self-learning	800	0-65535	mm/s	0.800m/s
……					
F186	Creeping speed at start	50	0-65535	10ms	0.50s
F187	Leveling induction calibration running	0	0-65535		
……					
F193	Empty-load compensation at lowest landing	0	0-65535	‰	0.0‰
F194	Full-load compensation at lowest landing	0	0-65535	‰	0.0‰
F195	Empty-load compensation at top landing	0	0-65535	‰	0.0‰
F196	2nd main landing by duplex control	0	0-64		
……					

List 3-1 the Description of Parameters

3.2 Parameter Setting Explanation

In order to meet the requirement of the riding comfort and efficiency by the passengers, the lift should follow the S-shaped curve in the trip as is shown below. The control system is capable of adjusting the acceleration and deceleration rates and the time constants around the four jerks in the curve to optimize the riding comfort and efficiency.

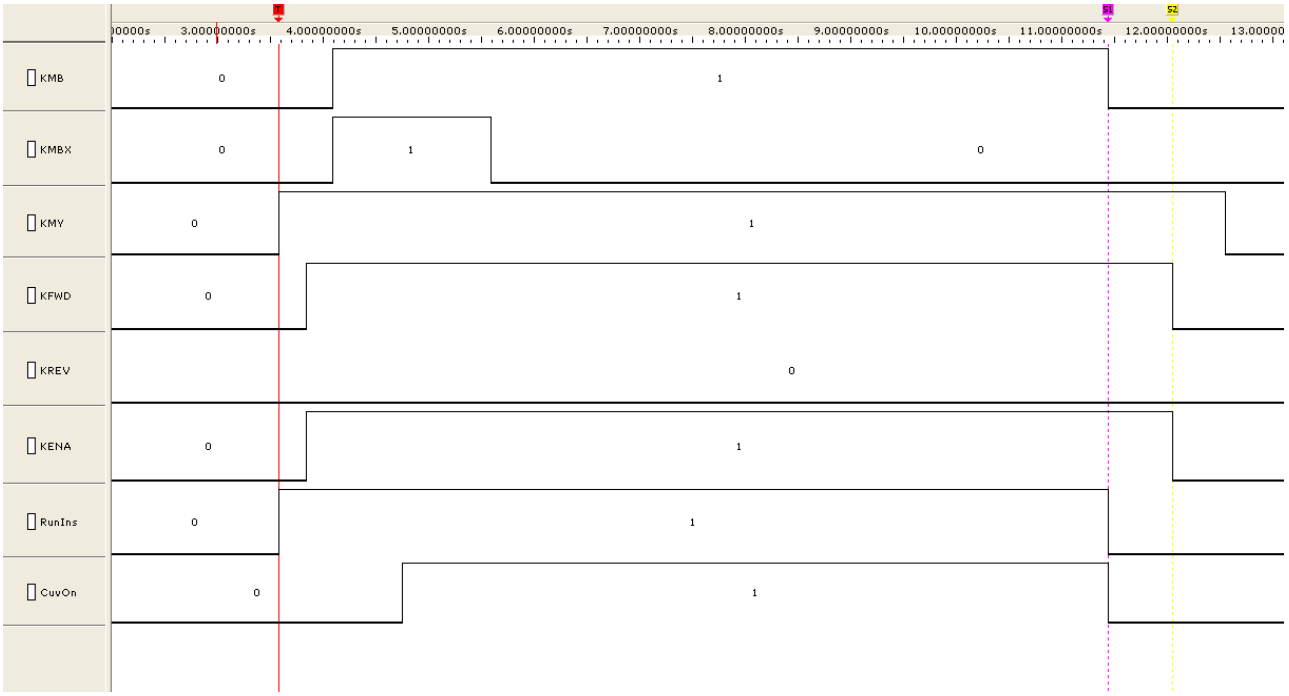


Fig. 3-1 Diagram from Start to Stop in Sequence

KMB Brake output

The delay output set by F16(D8) follows KENA, with RunIns and KMB cleared out simultaneously.

KMBX Output of brake excitation KMBX along with KMB, to be cleared out 1.5 s after KMB output begins.

KMY Contactor of speed regulator output for KMY output along with RunIns, to be cleared out 0.5 s after KENA is cleared out.

KFWD Speed regulator output for up direction

KFWD output along with KENA when going up and cleared out together with KENA.

KREV Speed regulator output for down direction

KREV output along with KENA when going down and cleared out together with KENA.

KENA Speed regulator initiation output

KENA output 0.5 s after KMY, to be cleared out after the KMB clearing delay output set by F17(D9).

RunIns Directory for internal running.

CuvOn Speed directory output

CuvOn output after KMB output delay set by F58(D10), the timing actually starts the moment any brake switch signal is detected. CuvOn and RunIns are cleared out simultaneously.

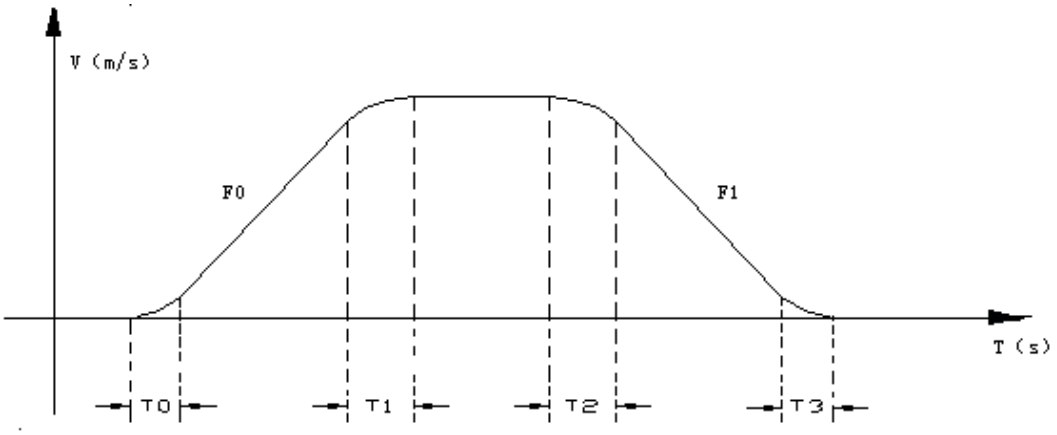


Fig. 3-2 Diagram of the Traveling Curve

A Brief Description of an Elevator Trip

As soon as the internal directory for running *RunIns* is given at the start, the output contactor of the inverter is closed, giving out the signal for the inverter to go into operation. On one hand the brake contactor is driven by the time delay F16, on the other hand the speed reference curve for the trip is generated by time delay F58. The whole curve of the trip comprises rounding up at start (in time T0) → linear acceleration (constant acceleration stage by F0) → jerk round end of acceleration (in time T1) → running at constant speed → jerk round start of deceleration (in time T2) → linear deceleration (constant deceleration stage by F1) → rounding down for stop (in time T3) and stop. In the process of leveling the internal directory for stop comes first, and the brake contactor opens. after delay time F17, the signal for the inverter to be in operation is removed while the speed directory is shielded out. (In fact the analogical speed reference usually drops to zero whereas the staged digital speed reference has already had it removed meanwhile the internal directory for stop is released); After a delay of 0.5 s, the output contactor of the inverter is released.

F0 — The accelerating slope ratio between T0 and T1, i.e., the acceleration, invalid with digital speed reference.
F1 — The decelerating slope ratio between T0 and T1, i.e., the deceleration, invalid with digital speed reference.
F2 — T0 is the time for rounding up at start, the value 130 is recommended, invalid with digital speed reference.
F3 — T1 is the time for the jerk between acceleration and constant speed, the value 110 is recommended, invalid with digital speed reference.
F4 — T2 is the jerk between constant speed and deceleration, the value 110 is recommended, invalid with digital speed reference.
F5 — T3 is the time for rounding down before stop, the value 130 is recommended, invalid with digital speed reference.

★ THE ABOVE SIX PARAMETERS ARE VALID WITH ANALOGICAL SPEED REFERENCES ONLY!

F6 — Rated speed of the elevator
F7 — Rated rotations of the motor
F8 — Number of the pulses by encoder

THE ABOVE THREE PARAMETERS ARE VERY IMPORTANT! They must be set in accordance with the normal specifications of the equipment, otherwise the lift would run in failure or maloperation, for instance, the

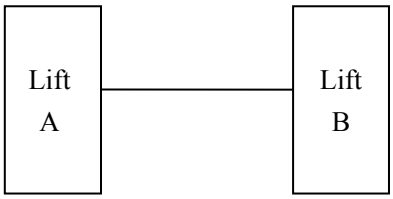
failure in speed measurement could result in generating incorrect speed reference. Whenever any ONE of these THREE parameters varies, a self-learning throughout the hoistway must be done to ensure the perfect performance of the lift system.

When the feedback pulses into the control system comes from other components which works on the frequency shunt of the signals it receives from the encoder, the value should be set as that after the frequency shunt instead of the original value from the encoder, e.g. the encoder generates 1024 pulses per rotation and the component takes in is a shunt of it that is one fourth of 1024, hence the correct value should be 1024/4 = 256.

F9 — Locked home floor

F10— Floor offset. Difference in floor number refers to the number of floors served by one of the lift in a duplex, but NOT served by the other.

F11— No. of floor. The total floor number is to be set according to the actual number of leveling plates.



The following is an example to set the parameters F10 and F11:

There are two elevators in duplex in a building, Lift A serves the 15 floors above ground only while Lift B serves the 15 floors above ground and 2 floors underground.

For Lift A, the total floor number is 15, “floor offset” is 2 so that the address of landing calls and in-car registration begins with Address 3;

for Lift B, the total floor number is 17, “floor offset” is 0.

IMPORTANT: If the TWO lifts in duplex control have different by-pass floors, the by-pass floors must have leveling plates installed as is shown below:

Actual Floors	Actual Indication	Floors By Lift A	Fl. address of Lift A	Set Indications for Lift A	Floors by Lift B	Fl. address of Lift B	Set Indications for Lift B
4	4	4	5	F69=4	4	5	F69=4
3	B1	3	4	F68=60	3	4	F68=60
2	G	2	3	F67=70	by-pass	3	F67=70
1	1	1	2	F66=1	1	2	F66=1
-1	-1				-1	1	F65=50

List 3-2 an example to set parameters F10 & F11

As is specified in the list above, Lift B must have a leveling plate installed on Floor 2 in the same way as Lift A does.

For **Lift A:** total floor number is 4, “floor offset” is 1, the landing call and registration address begins with 2. Indication settings: F66(for Address 2 and so on)=1；F67=70； F68=60；F69=4. Landing floors: 1(for the floor by address 1)-Yes(for landing allowed)；g-Yes；b1-Yes；4-Yes.

For **Lift B:** total floor number is 5, “floor offset” is 0, the landing call and registration address begins with 1 for

(Fl.-1) and 2 for (Fl.1). Indication settings: F65=50；F66=1；F67=70； F68=60；F69=4. Landing floors:-1- Yes；1-Yes；g-No (for landing NOT allowed, calls and registrations on the floor by address 3 invalid with Lift B)；b1-Yes；4-Yes.

F12— Inspection speed. Inspection speed between 0 and 0.5m/s.

F13— Releveling speed. Releveling speed refers to the speed at which the lift returns to leveling from outside the leveling zone, between 0 and 0.15m/s.

F14— Door-closing delay 1: When the lift is answering a landing call, the door will hold open in the time delay and closes when it elapses, valid ONLY without attendant.

F15— Door-closing delay 2: When the lift is answering a registration in car call, the door will hold open in the time delay and closes when it elapses, valid ONLY without attendant.

F16— Brake delay. Brake-open delay refers to the time between giving out the signal for the speed regulator to start operation and opening of the brake contactor.

F17— Operation removal delay. Operation removal delay is the time from closing of the brake to clearing out of the signal for operation of the speed regulator.

F18— Fire home. The main landing for fire return service is the predetermined landing, to which the elevator returns after the fire switch is set on.

F20— Homing Delay. Delay for returning to the main landing. When F20 > 0, the lift will return to the main landing preset by F22 after the delay set by F20 after it has served the last landing call or registration in car. The lift will NOT do it if F20=0.

F21— Level adjust distance. Tolerance at leveling is the distance deviated from the landing sill level in mm. To be exact, this parameter should be regarded as the compensation for leveling delay. Due to the varied sensibility of photo switches and magnetic switches, the length of the leveling plates of a particular lift varies accordingly.

F22— 1st main landing for duplex control. The first main landing for duplex control (see F20，F196).

F23— Duplex control mode. The parameter is 3 for both master lift and slave lift, and set F181=0 for master lift and 1 for slave lift;

1——slave lift of duplex control（the old program is compatible，only for slave lift）

3——Duplex control mode（see F181）.

F24— Drive mode of inverter, 0 for digital control;1 for analogy control; 2 for analogy control with creep.

F25— Type of input I, for normally open/closed setting at the input section X0-X15, it is a 16-bit figure, the lowest bit for X0 while the highest for X15. Anywhere in the section is set as normally open, the corresponding bit should be set **0**; whereas **1** for normally closed. This parameter can be done under the menu of Input Type in the hand-operator.

F26— Type of input II, for normally open/closed setting at the input section X16-X25, it is a 16-bit figure, the lowest bit for X16 while the highest for X25. Anywhere in the section is set as normally open, the corresponding bit should be set **0**; whereas **1** for normally closed. This parameter can be done under the menu of Input Type in the hand-operator.

F27— Type of input III, for normally open/closed setting at the input section TX0-TX15, it is a 16-bit figure, the lowest bit for TX0 while the highest for TX15. Anywhere in the section is set as normally open, the corresponding bit should be set **0**; whereas **1** for normally closed. This parameter can be done under the menu of Input Type in the hand-operator.

F28— Type of input IV, for normally open/closed setting at the input section TX16-TX19, it is a 16-bit figure, but

only 4 of the 16 bit in use, the lowest bit for TX16 while the 4th in use for TX19. Anywhere in the section is set as normally open, the corresponding bit should be set **0**; whereas **1** for normally closed. This parameter can be done under the menu of Input Type in the hand-operator.

Calculations by the exponent of 2:

2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
32768	16384	8192	4096	2048	1024	512	256	128	64	32	16	8	4	2	1

For instance, in Input Type, X5 for normally closed (up limit switch); X6 for normally closed (down limit swtich); X7 for normally closed (up one declaration switch); X8 for normally closed (down one declaration switch), with the other input points from the master control board set normally open. Parameter F25 is the value when the input point X0-X15 which serves as the 16-bit binary input is connected in **1**. There are 16 bit in all, ranging from right to left.

X 15	X 14	X 13	X 12	X 11	X 10	X 9	X 8	X 7	X 6	X 5	X 4	X 3	X 2	X 1	X 0
0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0

$$2^{8} + 2^{7} + 2^{6} + 2^{5}$$

Parameter F25=$2^{8}+2^{7}+2^{6}+2^{5}$=480, then F25 becomes 480 by itself. The settings of other parameters under Input Type can be dealt with accordingly.

IMPORTANT for Settings in Type of Input

TX3— The overload switch must be the ONE of the normally -CLOSED switches! Should a normally-open switch be here in used, it would fail to work properly in case it breaks down itself or the overload protection breaks off. The failure to detect an overload situation would most likely to set the elevator in service in danger!

Likewise, it is recommended that limit switches, terminal deceleration switches and so on should be the ones of normally-closed type in order to avoid any hazards.

TX7— If the light load switch is NOT in use, it should be set normally-closed. Failure to do so would lead to deletion of all the in-car registrations whenever there are more than FIVE (to be set by F120) of them, taken for anti-nuisance situation by the system.

TX11— The door-opening limit switch TX11, door-closing limit switch TX12 and the safety edge TX13 of the back door.

TX11 and TX13 should be set normally -closed and TX12 should be set normally –open if without a rear door. They should be set based on the field situation if with a rear door.

F29— Service floor 1, the figure here is one of the 16 floors (1-16), which is allocated to a floor by a 16-bit binary for **1**. The parameter can be set under the menu of Door Blocking by the hand-operator.

F30— Service floor 2, the figure here is one of the 16 floors (17-32), which is allocated to a floor by a 16-bit binary for **1**. The parameter can be set under the menu of Door Blocking by the hand-operator.

F31— Service floor 3, the figure here is one of the 16 floors (33-48), which is allocated to a floor by a 16-bit binary for **1**. The parameter can be set under the menu of Door Blocking by the hand-operator.

★ With duplex control, the sequence of the floors is based on the floor arrangement of the building as a whole. **For example**, A lift serves eight of the 16 floors (1-16) without basement and two of the floors (2, 5) are NOT to be served, hence the lift is allowed to stop at all floors except Fl.2 and Fl.5.

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1

$2^{15}+2^{14}+\ 2^{13}+\ 2^{12}+\ 2^{11}\ +2^{10}\ +2^{9}\ +2^{8}\ +2^{7}+2^{6}+2^{5}\ +\ \ \ \ 2^{3}+2^{2}\ +\ \ \ \ 2^{0}$

Parameter F29=$2^{15}+2^{14}+2^{13}+2^{12}+2^{11}+2^{10}+2^{9}+2^{8}+2^{7}+2^{6}+2^{5}+2^{3}+2^{2}+2^{0}$=（$2^{16}$–1）-$2^{4}$-$2^{1}$＝65517, here F29 comes out automatically as 65517. The setting of other floors in service follows the same way.

F32— Selection of the inverter types, setting the type of inverters in use with digital control:
0: iAstar，YASKAWA，CT，FUJI inverter；1：SIMENS inverter；2: KEB inverter；3：MICO inverter；4：SIEI inverter；5：Dietz inverter. The specific digital sequence may refer to the instruction of the inverter in use.

F33— Interval between trips in automatic running test. Default value is 5 s.

F34— Number of trips in automatic running test. Default value is 0. Denote do not enable testing function.

Notes: Both **F33** and **F34** are parameters designed for testing purposes. Only when both parameters are set and register calls by cop or hand-operator, the elevator will automatically run in registered floors.

F35— Fire mode. Fireman service is a parameter for acceptance to determine the mode of fireman service, 0 for China Standard, 1 for Schindler Suzhou Standard with (the only difference lying in door-closing permitted in fire-fighting).

F36— Brake switch detection mode. After the control system gives out a brake control signal, a normally-closed contact in the switch is ready for the master control board to detect the preset time for testing delay before the brake opens by means of the signal. **0** for NO brake switch; **1**for being set elsewhere; **2** for being set in Hong Kong.

F43— Landing call buzzing and flashing by attendant. **0** for neither buzzing nor flashing；**1** for buzzing without flashing；**2** for flashing withut buzzing；**3** for both buzzing and flashing, all the above with standard attendant service；**4** for waiting with door open, which can be combined with any of **0~3**, e.g., **7** for all buzzing and flashing and waiting with door open together.

F44— Local address for serial communication. 255 for lift in operation or single lift monitoring. If the elevators are under residential zone monitoring by Port 485 or remote monitoring by Port 232, any one of the lifts in the bank should have a natural numeral smaller than 255 set for its master board so that the distant PC can identify its master control PCB. That's why this parameter varies from one lift to another in the group.

F45— Deceleration distance for single Floor. To be used in digital control. If the traveling speed is smaller than 1.0 m/s, it is the only one distance for speed reduction; when the speed gets greater than 1.5 m/s, it is the deceleration distance for a single floor.

F46— Deceleration distance for double Floor. To be used in digital control. It is the distance for deceleration for two or more than two floors when the traveling speed is no greater than 1.75 m/s. When the traveling speed is 2.0 m/s, it is the deceleration distance for two floors ONLY.

F50— Front door-opening allowed 1. For Fl.1-16 (absolute value of floors) for opening the front door.

F51— Front door-opening allowed 2. For Fl.17-32 (absolute value of floors) for opening the front door.

F56— Leveling adjustment up（50 for baseline）

F57— Leveling adjustment down（50 for baseline）

These two parameters are invalid with digital mode. With analogy control, use F56 and F57 in adjusting leveling deviation only when the deviation remains the same value and in the same direction. F56 for lowering over-leveling by reducing the value whereas F57 for raising under-levelling by increasing the value. The range of parameter is 0-100 and 50 by ex-works.

★ Note: Both parameters F56 and F57 feature a compensation adjustment in floor leveling for a range as small as 15 mm. If the deviation exceeds 15mm, it is recommended that the position of leveling switches, plates should be adjusted at first, then use the parameters for fine adjustment. Otherwise the traveling comfort would be affected.

F58— Speed curve delay at start, the time delay from opening the brake to giving out the speed curve, is set at 5 by default for 0.5 s.

F60— KMC testing mode (the 1st contactor), **0** for KMC pre-positioned, always on without testing; **1 and 2** for KMC pre-positioned, always on with testing against sticking together; **3** for KMC positioned in the rear, off after every trip with testing against sticking together;

F61— Distance for triggering arrival gong is 1200 by default, the value stands for 1.2 m from the leveling position.

F62— Time limit for anti-slippage operation is 32s by default setting. If the lift fails to receive any leveling signal within 32 seconds, it will stop service, reporting Error 25. (The value is defined as between 20 and 45 seconds by GB7588-2003).

F63— Setting the step of multi-speed (number from 1 to 5)

F65~ F112— Indication of floors, the figures or symbols in display for Floor 1~48. The option enables man to set floor indication by **B**, **H** and **M** etc. For instance, with a lift serving FIVE floors, man wants to have the floor indication B1, -1, 1, H and 3, then the setting should be F65=60，F66=50，F67=1，F68=84，F69=3 respectively.

★ With duplex control , the indication arrangement should follow the preset floor sequence, see the example under F11.

F120— Number of registrations an-nuisance, **0** for no anti-nuisance; **1** for triggering by the light gate without light gate activated for three incessant floors; 2～64 is the range for setting the number of registrations to start anti-nuisance option.

F122— Release direction delay during inspection service. Delay at change in direction during inspection service is the preset time from switching off the brake contactor output to clearing the traveling direction.

F130— Holding door-opening/closing torque. 0 for no holding torque. 1 for Holding door-opening torque. 2 for holding door-closing torque. 3 for holding door-opening and door-closing torque. 4 for holding door-opening torque when traveling.

F152— Delay for car-lighting before automatically switching off car-lighting and fan, default value is 5 minutes.

F156— Door lock and safe loop relay check enable. 0 for YES, 1 for NO.

F160— Clearing error registrations manually enable. 0 for OFF; 1 for ON.

F164— Load-weighing signal, 0 for overload, full load switch from car board. 1 for load input to master board by can-bus. 2 for overload, full load switch from car board but load compensation input to master board.

F165— Door open selection in testing traveling. 0 for open door in testing; 1 for forbidden door in inspection; 2 for don't open the door in testing.

F175— Creeping speed at start, see F186.

F180— Velocity increment. Analogy speed given peak increment, range from 0.0% - 110.0%, default value is 1000, denote 100.0%.

F181— Lift numbering in duplex control. Range from 0-7. Lower number has high priority. (F32=3)

F182— Steps of speed reduction switches (Half the number of the decelerated switches)

F183— Speed at self-learning

F186— Creeping speed at start, see F175

F187— Leveling induction calibration running.

F193— Empty-load compensation at lowest landing

F194— Full-load compensation at lowest landing

F195— Empty-load compensation at top landing

F196— 2nd main landing by duplex control

3.3 Mounting Distance of Deceleration Switches

Mounting Distance of Deceleration Switches for analog				
Rated speed	1.0m/s	1.5m/s	1.6m/s	1.75m/s
Deceleration for single Fl.	1.2~2.0m	2.2~2.6m	2.4~2.6m	2.2~2.6m
Deceleration for double Fl.				

Mounting Distance of Deceleration Switches for digital				
Rated speed	1.0m/s	1.5m/s	1.6m/s	1.75m/s
Deceleration for single Fl.	1.2~2.0m	2.2~2.6 m	2.7~3.0m	2.2~2.6m
Deceleration for double Fl.				3.6~4.5m

Chapter IV System Adjustment

4.1 IMPORTANT

4.1.1 It is strongly recommended that all users who purchase and use STEP products should CAREFULLY READ THIS INSTRUCTION and the instructions on other equipment that works together with this control system by STEP before system testing and putting the lift system into operation. The testing is to be carried out according to the instructions and recommended parameters in this INSTRUCTION HANDBOOK in order to avoid any unexpected losses.
4.1.2 Special attention shall be paid to studying Parameter Setting in detail before system testing and putting the lift system into operation in order to avoid any unexpected losses.
4.1.3 System testing can ONLY start after ensuring all mechanical components of the system, especially those in the hoistway are reliably installed, (those installed in the machine room depends on the readiness of the machine room).
4.1.4 System testing can ONLY start when ensuring all the equipment and devices that should be installed and tested in advance have been installed and commissioned properly.
4.1.5 The tester who is assigned to the testing task shall be given the confirmation of his responsibilities in testing by those who are in charge of the installation and testing of the system and other equipment and devices relating to the lift system.
4.1.6 The tester is supposed to CAREFULLY EXAMINE the mechanical equipment, other equipment and devices in relation to electric testing work to ensure that they have been properly installed and commissioned.
4.1.7 The tester MUST CAUTIOUSLY EXAMINE the workplace to make sure there is Neither hazards to human body and/or equipment Nor any unsafe factors such as whatever hidden hazards on the jobsite.
4.1.8 The tester should have the qualification issued by the authority for doing the job in elevator testing.
4.1.9 If you think this INSTRUCTION HANDBOOK is insufficient for you to do the testing, feel free to CONTACT STEP immediately so that you can get our assistance in time.
4.1.10 Before the testing starts, the tester shall check the field conditions thoroughly in order to decide whether ALL CONDITIONS ARE MET for the control system testing.

4.2 Inspections before Switching on Power

An inspection on the electric parts is a must after the completion of the electric installation of the control system.
4.2.1 Check whether the wire connections between the parts are correct according to the INSTRUCTION and circuit diagrams.
4.2.2 Check whether there are any misconnections between the high- and low-voltage parts and measure the resistance between the different-voltage circuits using an AVO meter, making sure the resistance against earth is ∞**.**
4.2.3 Examine the power supply lines to the control cabinet and motor are correctly done in order to avoid any damage to the inverter.
4.2.4 Examine the connections to earth from the control cabinet, the casing of motor, the car and the landing doors respectively, making ensure they are reliable enough for human safety.

4.3 Power up and inspection

4.3.1 Inspection before power up

1. Short-circuit inspection of the control cabinet to ground before power up:

(1) Input power line three-phase to ground

(2) Motor line three-phase to ground

(3) Terminal 220V to ground

(4) Communication line to ground

(5) Encoder line to ground

Please eliminate the short-circuit if it occurs for any of the above items.

2. Grounding inspection: (please make sure that the following items need to be grounded reliably)

(1) Control cabinet is grounded.

(2) Motor is grounded.

(3) Car is grounded.

(4) Door operator is grounded.

(5) Wireway is grounded.

(6) Control cabinet of the encoder shielding layer is grounded.

(7) Motor of encoder shielding layer is grounded.

Note: One terminal of shielding layer of the asynchronous motor encoder is grounded，both terminals of shielding layer of the synchronous motor encoder need to be grounded.

3. Wiring inspection of communication line、encoder line and power line：(Please affirm whether it can meet the following request in the scene, please correct if not.)

(1) Hoistway communication lines are twisted in pair with the distance of intertwist <35cm.

(2) Cabin communication lines are twisted in pair with the distance of intertwist <35cm.

(3) Parallel group control communication lines are twisted in pair with the distance of intertwist <35cm (only for parallel or group control lifts)

(4) Encoder lines and power lines are in the different wiring ducts.

(5) Communication lines and power lines are in the different wiring ducts.

(6) Parallel group control communication lines and power lines are in the different wiring ducts. (only for parallel or group control lifts)

Note: Asynchronous motors of iAStar transducers don't need to self-tune. For phase angle self-tuning of synchronous motors, only inspection travel is enough and there is no need of short-circuit to run.

4.3.2 Inspections after Switching on Power

4.3.2.1 Switch on the main switch, if the green light on the phase-relay KAP lights up, the phase order is correct; if NOT, switch off the power supply and exchange connections of any two of the three phases and switch on power again.

4.3.2.2 Check the voltage levels on the terminals of the isolation transformer TCO in the cabinet to ensure they are within their normal voltage ranges respectively. When the above checks prove correct, do the following:

(1) Switch on fuses FUn（n=1，2，3……）;

(2) Switch on the power supply control so that the switch power unit TPB (Voltages on the terminals of TPB is shown in List 4-1 below) is powered on and the master control board starts working.

Part	L～ N	24V～ COM
Voltage	220±7%VAC	24.0±0.3VDC

List 4-1 Voltages on the Terminals of TPB

(3) Switch on the Emergency Switch in the control cabinet with its corresponding LED lighting up, and inspect the following:

◆ Check if the door interlock circuit works properly;

◆ Check if the door zone signals, the up limit and down limit switch signals work properly;

◆ The working status in the handset programmer should have “INSPECTION” in display.

If anything wrong or abnormal is herein found out, further checks and corrections should be done.

4.4 System Parameter Setting

4.4.1 Inverter Parameters (Self-learning of Motor Parameters)

Prior to testing for the inspection travel, the inverter parameters must be set correctly. The parameters should be set in accordance with the practical situation on the jobsite and the definitions and setting method of a particular parameter should refer to the correct ways in setting the system parameters specified in Chapter III and ADDENDUM II respectively.

4.4.1.1 Prior to testing for inspection travel, the inverter parameters MUST BE SET CORRECTLY.

4.4.1.2 The parameters of varied inverter types should refer to the ADDENDUM or the INSTRUCTION of the inverter in use.

4.4.1.3 The basic motor parameters should be entered according to the norm label on the motor and the self-learning of motor parameters should refer to the INSTRUCTION of the inverter. Steps of the self-learning of motor parameters are as follows:

□ Switch off power, push down the emergency stop button and turn the AUTORUN/INSPECTION switch to INSPECTION in the control cabinet.

□ Make sure the system wirings for brake are connected to Terminal ZQ1 and ZQ2 correctly in the control cabinet.

□ Hoist up the car, remove the wire ropes from the traction sheave with protection against wear and tear.

□ Make sure no frictions will take place between the traction sheave and other parts and between other parts of the lift throughout the process.

□ Jumper adjustment: To ensure both safety circuit 102-114 and door-lock circuit 120-118 are through.

Remove output contactors Y0, Y1, Y2 and Y3 from the master control PCB together with their wirings on the common terminals, making marks for re-connection and keep them in a bundle with isolative tapes against short-circuit.

□ Switch on power and reset the emergency stop button.

□ Make sure contactors KMC, KMY, KMB and KMZ in the control cabinet have closed up, the inverter is powered on with correct indication.

□ The traction machine has its brake open. Try turning the traction sheave around by hand, you should be able to turn it without much resistance.
□ Go on with the self-learning of motor parameters according to the steps specified in the instruction of the inverter and note down the parameters by self-learning..
□ Restore all the jumpers as they are before.

4.4.2 Parameters of Master Control PCB

The parameters can be modified or adjusted by the handset. Refer to Chapter III in more detail.

4.5 Low-speed trial running and preparation before high-speed running

4.5.1 Inspection running of machine room

1. The following items should be checked before inspection of machine room

(1) the inspection switch of the control cabinet is turned to "Inspection" position and the car top inpection button is at "normal" position.

(2) the safe loop and the door-lock loop operate normally. **Never make door locks shorted**;

(3) encoders are installed and wired properly;

(4) check that the transducers are normal after powered up, that its parameters are set properly. and that the working state of the lift is " Inspection";

(5) correctly connect brake lines of traction machine to the terminals in the control cabinet;

(6) wiring of up/down limit switches and up/down forced slow-down switces is normal;

(7) Wiring of preferential loop of the car top inspection is in normal;

2. Inspection running of machine room

Push the slow-up/down button on control cabinet when inspection running conditions are satisfied, and then the elevator should moves up or down at the set speed.

(1) Check up or down motion. Observe the operation direction of elevator. If the direction is opposite, change any two-phase of the asynchronous motor and A/B phase of the encoder; for the synchronous motor, invert the signal from the main board to the transducer so that it can operate in normal or reversal direction.

(2) Inspect up or down motion. If the motor feed-back speed by the transducer is unstable or obviously different from the given speed, please change A/B phase of the encoder and start inspection with power up again.

(3) Inspect up or down motion. Observe whether speed displayed on main board is +or-. If the display is opposite, please change A/B phase of speed feedback port on the main board.

(4) Please affirm that X10(down leveling) actuates first compared to X9(up leveling) through the leveling when inspecting up leveling of the lift. Please correct it if the order is opposite; otherwise, the hoistway self-tuning can not be completed successfully.

4.5.2 Inspection Ride on Top of Car

If the inspection ride is worked out properly from the machine room, try it again on top of the car.

4.5.3 Inspection of CAN communication cable and address setting of 04 board

1. Inspection of communication terminal resistor：

(1) Check the terminal resistor between CAN 1 communication ports TXA+ and TXA- is 60 ohm(in car and hall each 120 ohm)

(2) Affirm CAN2 communication ports TXA1+ and TXA1- in are parallel or the group control terminal resistor is 60 ohm (only for parallel or group control elevators)

2. Address Setting of the SM-04 board

Please set the address of SM-04 board from 1 to the topmost in turn. Please set the address of SM-04 board in car as 0.

4.5.4 Adjustment of opening/closing door

1. Make the elevator in inspection state and in leveling position;

2. Provide gate operator supply;

3. Move the gate by hand. Monitor whether signal of openning door to the set position (TX0) and closing door to the set position (TX1) on the main-board is normal;

4. Affirm safety shoe and overload signal is not working；

5. Put the gate at the middle position;

6. Push the close door button. Affirm output of the door close relay is normal and the door can be closed properly until the signal of closing door to the set position activates;

7. Push the open door button. Affirm output of the door open relay is normal and the door can be opened properly until the signal of opening door to the set position activates.

4.6 Shaft self-tuning

Hoistway self-tuning is that the elevator works at a self-tuning speed and records the positions of each floor and switches in the hoistway. The positions of floor are the basis for normal run brake and floor display, so elevator shaft self-tuning is necessary before high-speed running. Procedures of self-tuning are as follows:

1. Affirm the elevator meets the safe operation conditions.

2. Installation and wiring of each switch in the shaft is correct. Traveling cables and outside cables are properly wired;

3. Set the elevator in inspection position;

4. Enter the self-tuning menu via a hand-held programmer and operate as per the menu;

5. Make the elevator in automatic state. Elevator will run down to the bottom at the self-tuning speed, and then run above to start self-tuning. Hand-held manipulator will show "success of self-tuning" after the successful completion of self-tuning;

6. If the control system has abnormal phenomena during the self-tuning process, self-tuning will stop. At the same time, the corresponding fault signal will be sent and the hand-held manipulator will show "failure of self-tuning ".

4.6.1 2 floor/2 landing self-tuning method

1. Make the elevator in inspection position;

2. Make the elevator in limit position and make sure the up leveling switch is prolapsed.

3. Enter the self-tuning menu via a hand-held programmer and operate as per the menu;

4. Make the elevator in automatic state. Elevator will run at the self-tuning speed. Hand-held manipulator will show "success of self-tuning" after the successful completion of self-tuning.

4.6.2 Interpreting the meaning of hoistway data (monitoring state): unit mm

No.	Meaning unit mm
1-32	1-32 floors hoistway data
33	Length of leveling insert plate
34	Leveling switch center distance
35	Distance of up slow down switch on floor 1
36	Distance of up slow down switch on floor 2
37	Standby
38	Standby
39	Distance of down slow down switch on floor 1
40	Distance of down slow down switch on floor 2
39	Standby
40	Standby

4.7 High-speed running

1. High-speed trial running

Affirm the elevator meets the safe operation conditions when low-speed running is satisfactory. Then start high-speed trial running after the elevator shaft self-tuning as follows:

1. Set the elevator to the normal position.

2. With the floor selection interface by activating the MONITOR menu of handheld programmer, you can select floors for elevator's trail running: one floor run, double-floor run, multi-floor run and the full floor run.

3. Affirm the elevator can normally close the door, start-up, accelerate, operate, stop the car, slow down, stop eliminate the signal and open the door.

2. Safety testing

1) Safe loop

Test requirement: the safe loop relay releases when any safety switch activates;

2) Door lock loop

Test requirement: the door lock relay releases when any hall door lock disconnects and when the car door lock disconnects;

3) Safe loop relay conglutination protection (not necessary if there is no safe loop relay) .

Test requirement: Push the emergency stop button on the control cabinet to make the safe loop relay release. Press the safe loop relay by hand. The main-board should be protected and can not be reset automatically;

4) Door lock relay conglutination protection (not necessary if there is no door lock relay)

Test requirement: Press the door lock relay by hand when the door is open. The main-board should be protected and can not be reset automatically;

5) Band brake contactor conglutination protection

Test requirement: Press the band brake contactor by hand when it stops. The main-board should be protected and can not be reset automatically;

6) Output contactor conglutination protection

Test requirement: Press the band brake contactor by hand when stop. The main-board should be protected and can not be reset automatically;

7) Slip protection function

Test requirement: Inspection travel of the elevator in the middle floor. Removal two leveling sensor lines from console cabinet terminal (Suppose that the leveling signal is normal-open). Turn to normal state. The elevator runs to the leveling slowly. The main-board should be protected in 45 and can not be reset automatically;

8) Error floor protection

Test requirement: Run the elevator to the middle floor. Remove feedback terminal on the main-board. Inspect one or two leveling in down motion. Turn to normal state. Plug the feedback terminal in. Register instructions at the bottom. The elevator runs down at high-speed. When meeting the forced slow-down switch at the bottom, it can slow down normally to the leveling.

Run the elevator to the middle floor. Remove feedback terminal on the main-board. Inspect one or two leveling in up motion. Turn to normal state. Plug the feedback terminal in. Register instructions at the top. The elevator runs up at high-speed. When meeting the forced slow-down switch at the top, it can slow down normally to the leveling;

9) Overload function

Test requirement: Elevator overloaded switching action. Elevator should not close the door. The car buzzer should ring and overload lamp should turn on.

10) 110% load test

Test requirement: Put 110% load in the car. Reverse TX3 (overload signal) of the main-board, so that overloading does not work. The elevator can start and brake normally during high-speed running up and down for 40 times;

3. Function test of the lift

1) Automatic operation

Test requirement: Register a number of directives in the car, and then the elevator can normally and automatically close the door, start, stop, eliminate signal and open the door;

Registered a number of up and down directives, and then elevator can stop the car, slow down, eliminate signal and open the door normally..

2) Attendant operation

Test requirement: Make the car switch in attendant position and register several directives. Press the door close button continuously. The elevator can close the door, start, stop, eliminate signal and open the door. Register a number of up and down directives, and then elevator can normally stop the car,slow down, eliminate signal and open the door.

3) Independent running.

Test requirement: Make the switch in independent position in the car. The elevator should have no display and the call button is not working. Register directives in the car and press the door close button continuously. The elevator can close the door, start, stop, eliminate signal and open the door.

4) Fire return

Test requirement: Keep the elevator stop on a non-landing floor and make the fire rundown switch in position "ON". It should be immediately closed and return to landing with high-speed to open the door and keep the door open, all the calls and orders in the car should be invalid;

The elevator runs up at a high-speed and the fire rundown switch in position "ON". The elevator should stop at the nearest station and return to the landing at high-speed to open the door and keep the door open, all the calls and orders in the car should be invalid;

The elevator runs down at a high-speed and make the fire rundown switch in position "ON". The elevator should return to the landing directly to open the door and keep the door open, all the calls and orders in the car should be invalid;

5) Fire running (Only for the fire ladder)

Test requirement: Make the firemen switch of operation panel in position "ON" after the elevator fire back to the landing. Register a number of directives and press the close button continuously. The elevator can close the door, start, stop, eliminate all in-car registrations and does not open the door. The elevator should be opened when pressing the door open button continuously. Keep the opening state after the door opens.

6) Parallel group control (only for the parallel or group control elevator)

Test requirement: Register a number of signal outside. Control system will deploy the elevators which use the shortest time to response to the signal outside. When a elevator stop the car, the signal outside on the same floor should be eliminated at the same time. An elevator should wait on the landing when it is free.

7) Elevator lock function

Test requirement: Assume that the elevator stops on a non-landing floor and makes the lock key of landing in a

"lock" position. The elevator should close the door immediately, and should not response to the signal outside. Return to the landing at a high-speed. Delay to close the door after stopping and opening the door, turn off the light with no instructions, outside call and display outside;

Assume that the elevator is in operation and makes the lock key of landing in a "lock" position. The elevator should response to all the instructions one by one, and should not response to the signal outside. Return to landing with high-speed. Delay to close the door after stop and open the door, turn off the light with no all instruction, outside call and display outside;

Assume that the elevator stopped at landing floor and made the lock key of landing in a "lock" position. The elevator should close the door and turn off the light with no all instruction, outside call and display outside;

4.8 Riding Comfort Adjustment

◆ Factors affecting riding comfort

1. Mechanically: the vertical alignment of guiderails, the surface flatness on guiderails, the conjunctions between guiderails, the tightness of guideshoes on guiderails, the evenness in tension of the wire ropes, etc.
2. Electrically: ① Parameter settings regarding the travel curve such as acceleration, deceleration, time for the jerks, delays for start, stop and brake movement etc.
② PI parameter settings concerning vector control such as increment in ratio and integral time etc.

◆ How to Improve Riding Comfort

☆ Adjustment of the Mechanical Factors

1）The Guiderails

□ The surface flatness on guiderails

□ The vertical alignment of guiderails in installation

□ Treatment of the conjunctions between guiderails

The vertical alignment of and the parallel alignment between the guiderails should be controlled within the range of the national code (GB) in installation. If the tolerance goes too much beyond the permitted range by the code, the riding comfort at rated speed will be affected, resulting in shaking and vibration of the car, or sway and swing of the car in particular sections on the guiderails.

□ Rough treatment of the guiderail junctions may result in regular step-shakings in particular height on the guiderails.

2）The Tightness of Guideshoes on Guiderails

If the guideshoes are set too tight on the guiderails, step-shakings may occur at start and passengers may feel braking down at stop.

If the guideshoes are set too loose on the guiderails, the car is prone to swaying during the travel. With sliding guideshoes, a little leeway or gap should be kept between the guideshoes and the sliding planes of the guiderails in order to avoid the above problems.

Standing on top of the car, sway the car in the left-right direction by exerting strength on foot after each adjustment of the gaps until a little but obviously-felt leeway for the car to move horizontally between the guiderails.

3）The Evenness in Tension of the Wire Ropes, etc.

The unevenness in tension of the wire ropes will lead to some of the ropes are over-stretched and the others are inclined to jerks and vibration due to being too loose. This working condition of the ropes will have impact on the start, running at rated-speed and stop of the elevator.

Place the car in the middle of the hoistway, pull every wire rope with the same force by hand on top of the car. If the ropes go sidewise roughly in the same distance, the tension of ropes are OK; if the ropes go to a distance that varies from one to the other, you have to call back the installation people to re-adjust the tension of ropes.

The wire ropes are usually kept around a reel before installation so that a twist-strain exists in them. When they are mounted immediately from the reel, the lift is apt to vibration due to the twist-strain of the wire ropes. The solution lies in having the strain fully released before installation.

4）Fastening and Sealing of the Car

Great forces would act upon the car running at a high speed. If the car supporters or somewhere in the car walls are NOT well fastened, relative movement may take place between the parts and/or components when the lift travels at high-speed, which causes vibration of the car. During a ride at high speed, the car may sometimes give out wind noise and acoustic resonance most likely due to the weakness in the fastening and sealing of the car and the sealing of the shaft.

5）Damping Devices against Resonance

□ Rubber pads under the supporting beams, on which the traction machine sits.

□ It helps to eliminate car vibration to attach wooden pegs or clips or the similar on the ropes by the wedge sockets.

□ With the lifts using novel light-weight car interior decoration, the mass of the car gets lighter, which is prone to mechanical resonance, especially in the case of high-speed elevators in highrise buildings. The solution is to attach some fixed load on the car in order to alter the car's natural frequency so that the mechanical resonance can be eliminated.

6）The Traction Machine

Occasionally the traction machine in use was improperly assembled with mal-conjunction between worm and gear or with excessive wear and tear between them due to the long time in service, resulting in axial jerks and jumps during acceleration and deceleration of the running elevator, hence step-shakings.

7）Balancing of the Car

In occasional cases the mass of the car is not well in balance itself due to mal-design and/or mal–installation so that the car is inclined to one side, which generates bad friction between the guideshoes and guiderails causing vibration in travel. Try balancing the car by adding weight on the side of the car where the mass is smaller.

8）Miscellaneous

These may include the parallel alignment of the traction sheave and diverting pulley, and the adjustment of the braking gaps in operation, etc.

- **Adjustment of electric relevant factors**

Countermeasures to some problems of comfort on the site are as follows:

1. Pause when the elevator starts

1) Pause caused by turning back when the elevator starts:

It is possible that the electrical field has not been fully established when the band brake opens. Please increase the value of the main-board parameters F16 appropriately.

It is possible that PI response of the transducer speed loop is not enough. Please adjust PI parameters at low-speed part of transducer speed loop to speed up the system response.

2) Pause caused when the elevator starts with valve. It is shown that speed curve havs been given before the band brake completely opens. Please increase the value of the main-board parameter F58 to make the speed curve give a long-time delay

3) Some transducers matching synchronous motors need to increase compensation for weighing devices, such as Yasukawa, Fujitsu converter and so on. They can not start ideally if there is no increase. It is suggested for allocation of weighing devices and adjustment of transducers' relevant parameters.

2. Shock during the elevator running

Please adjust the corresponding PI of transducers. If it is a high-frequency vibration, please reduce PI response of the speed loop, otherwise increase it accordingly.

3. Shock when the elevator stops

1) Pause caused by running away when the elevator stops

It is possible that revocation of enabling and direction signal of transducers is earlier than release of band brake. Please increase the value of the main-board parameters F17 to extend the time of withdrawing the enabling and direction.

2) Pause caused by using band brake when the elevator stops but its speed is not zero.

It is shown that the band brake releases in advance. Please increase the value of the main-board parameters F17 to make the band brake releases after a longer delayed time.

4.9 Floor Leveling Adjustment

☆ The floor leveling adjustment may start as the adjustment of riding comfort is near finish.

4.9.1 Basic Requirements for Levelling

4.9.1.1 First of all both the door-zone inductors and the plates must be precisely positioned with its bisecting point in line with the bisected distance between the two door-zone inductors in order to avoid neither higher nor lower level of the car than the right and desirable leveling position.

4.9.1.2 When using magnetic switches, sufficient inserting length shall be guaranteed in installation in order to allow for the time needed by the inducting switches to act properly against the higher-up and/or lower-down phenomenon.

4.9.1.3 To guarantee good leveling, the system calls for a short creeping of the lift before stop.

4.9.1.4 In practice, the adjustment should begin with an intermediate landing until the leveling looks perfect on

that floor. The adjustment on other floors may continue based on the data obtained from the first-done landing.

4.9.1.5 By means of the adjustment in the curve formation, ratio and integral increment, it should be achieved that the landing position of the lift on the intermediate floor remains the same no matter whether the lift is going up or down, with a tolerance of ≤±2～3mm from trip to trip.

4.9.2 Adjustment in Leveling with Multi-staged Speed Reference

4.9.2.1 No Creeping or Longer Creeping

After the deceleration begins the system requires entry of creeping of the lift as a basic condition for leveling. The curve must be too flat so that there is no creeping whereas the curve must be too steep if the creeping lasts too long. Modify the curve until CREEPING APPEARS but NOT too long.

4.9.2.2 Lower-up and Higher-down or Vice Versa

When this phenomenon occurs, the creeping speed must be too high so that it should be adjusted.

4.9.2.3 Both Lower-up and -down or Higher-up and –down

If this happens at stop, the door-zone plates must be in a deviated position which should be adjusted to the right position.

4.9.2.4 Switches of the Terminal landings

If the terminal switches are improperly installed, the leveling accuracy on the terminal landings will be affected. Take the top landing for example:

□ The terminal switches on top landings are positioned at a greater distance than they are required for switching speeds.

□ The lift travels to the terminal landing at rated speed and slows down without leveling.

□ Set the lift into INSPECTION service immediately.

□ Measure the difference between the sills, which is the distance which should be moved upwards in adjustment. Likewise the adjustment in downward direction should be done in the dame way.

4.9.3 Adjustment in Leveling with Analogical Speed Reference

4.9.3.1 Confirm the Coincidence of the Stop Position for Every Travel

By means of the adjustment in the curve formation, ratio and integral increment as addressed in Chapter III, it should be pledged that the landing position of the lift on the intermediate floor remains the same no matter whether the lift is going up or down, with a tolerance of ≤±2～3mm from trip to trip.

4.9.3.2 *Adjustment of the plates in the door-zone*

□ Have the lift stop at one landing after another, measure and note down the difference △S between the sills (“+” for the higher car sill and “-”for vice versa).

□ Adjust the plate positions floor by floor, move the plate downward by △S if △S＞0, and upward by △S if △S＜0.

□ A self-learning must be done again after the plate adjustment is completed.

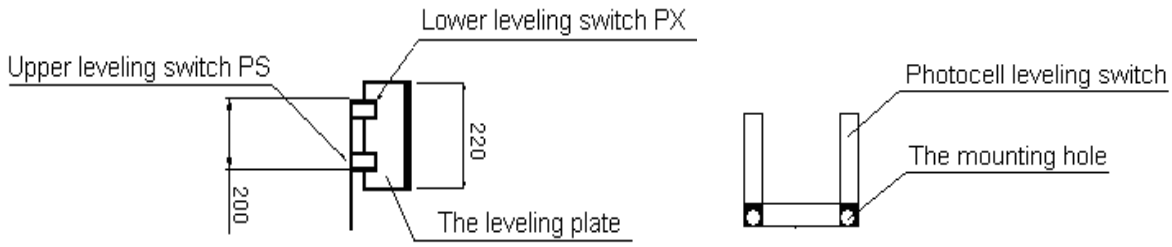
□ Check the leveling again. If NOT satisfied with the result, repeat STEP (1) through (3).

4.9.3.3 Adjustment of Parameters in the Menu

If the coincidence of the landing position shows a feature of repetition, but the leveling position varies between trips up and down on the same landing, e.g., up-higher and down-lower or up-lower and down higher. Go to the parameter menu and make adjustment by F56 and f57. The default value is 50 mm, reduce it with up-higher and down-lower but increase it with up-lower and down higher, the adjusting range should be 50% of the difference value. E.g., if the difference value in the case of up-higher and down-lower is 20 mm, decrease the parameter by 10 mm.

☆ **Requirements for Installation of Leveling Switches**

With the car sill and landing sill absolutely in line horizontally, the upper edge of the leveling plate should stay higher than the lower leveling switch and the lower edge stay lower than the upper leveling switch by roughly 10 mm respectively, which make it easy to adjust the riding comfort and the leveling accuracy. The standard length of the leveling plate is 220 mm, and each of them should have the same length with a tolerance NOT exceeding 3 mm (see the Fig. below).



(1) When using magnetic leveling switches

① Ensure enough inserting length of the plate into the leveling switches so that the switches can act effectively and reliably.

② The leveling plate must be mounted in strict vertical alignment to avoid the situation that only of the switches work properly while the other is left out of the effective working range, which spoils the normal operation of the lift.

(2) When using photocell leveling switches (STEP Serial Port accepts effective low-volt signals.)

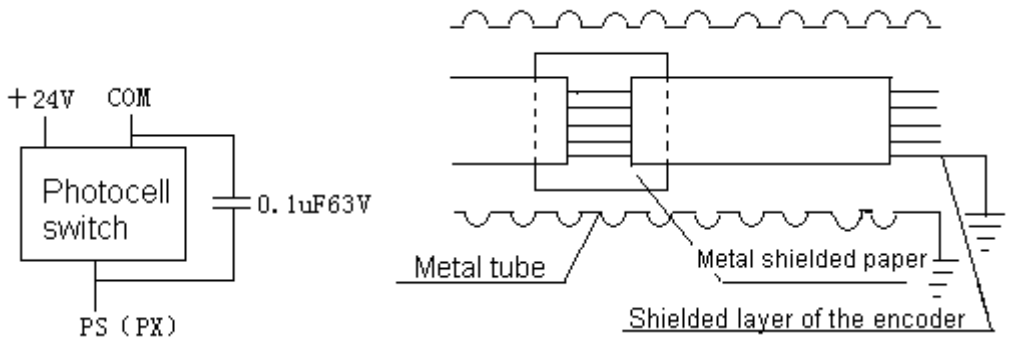
It is recommended to have the switches treated in the way below for better performance.

① Remove the paint on the shade around the mounting hole in order to make a perfect earth connection of the photocell's metal coat via screws, brackets and top of the car. If an earth wire is fixed beneath the fixation nut on the photocell casing with paint removed, greater reliability in use can be expected.

② It is recommended the connection to the car top terminal box via a shielded cable with an earth to it.

③ Using constant-open photo switches may greatly reduce the extent of being interfered.

④ In case one of the photo switches flashes in operation causing problems in travel or leveling, it could be attributed to interference. Attach a capacitor of 0.1μF63V between COM and PS (or PX） as shown in the Fig. below.



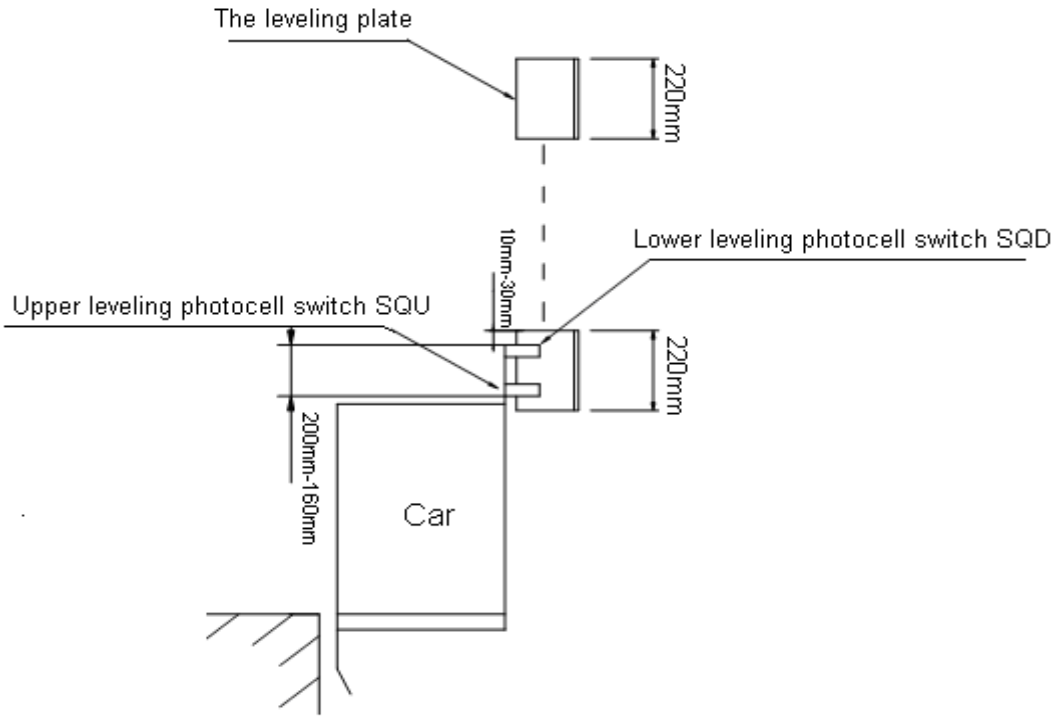
Attention: Photocell leveling switches are easily disturbed, it is not an advisable way to repeatedly replace and that will greatly increase the cost. But if the 4 notes above are adopted, the extent of being interfered will be greatly reduced.

☆ **Attention Should be Paid to Installation of the Switches**

① The leveling plates is supposed to insert into the switches by a depth of 2/3 while the plates on every floor should be in vertical alignment with one another in order to maintain the same insertion depth in the switches on

every floor.

② With the insertion well done, both ends of the plate should stretch out of the switch by a length of 10 mm to 30 mm (see the Fig. below).



③ The leveling plates of every floor should be in alignment with the inductor by the central line for better leveling performance after recording the floors.

④ Let the lift go up and down to every floor at normal speed, noting down the difference between the sills. When going up, the higher car sill is regarded as overleveling whereas the lower car sill as underleveling; when going down, the lower car sill is regarded as overleveling whereas the higher car sill as underleveling.

⑤ In case of the encoder is interfered or it is of poor quality, the leveling performance may also be affected. When wiring the system, the encoder cables or lines should be laid in a separate trunk from that one in which the power supply lines are laid.

☆ **Attention Should be Paid to Leveling Adjustment**

□ The distance between the centers of the leveling inductors is recommended as follows:

Without releveling with the door open: the distance in between should be 60 mm smaller than the length of the plate, with 30 mm stretching out on both ends respectively.

With releveling with the door open: the distance in between should be 40 mm smaller than the length of the plate, with 20 mm stretching out on both ends respectively.

□ Setting of F21(delay for leveling inductor), 6 mm for 1.75 m/s and below, 10 mm for 2.0 ~ 3.0m/s;

Setting of F56 and F57, F56 = 50, F57 = 50, Fine adjustment for each floor 20.

□ Adjust PI in the inverter to eliminate over-frequency.

□ Write down the leveling data of every floor, "+" for the higher car sill and "-"for the lower.

Single-floor up from F2 to FN, note down the leveling difference as Up(2),Up(3), ... Up(N),
Single-floor down from F（N-1）to F1, note down the leveling difference as Dn(N-1),...Dn(2),Dn(1),
Calculate the respective leveling difference of the floors,

X(2) = (Up(2) + Dn(2)) / 2;
X(3) = (Up(3) + Dn(3)) / 2;
X(4) = (Up(4) + Dn(4)) / 2;
…
…
X(N-1) = (Up(N-1) + Dn(N-1)) / 2;

X(2) ~ X(N-1) If the difference is greater than 10 mm, the positioning of the plate have to be adjusted, X(n) positive implies the plate's positioned too high, and vice versa. If the difference is smaller than 10 mm, use fine leveling adjustment.

□ With the plates re-positioned, let the lift do the self-learning, and write down the leveling data again.

Single-floor up from F 2 to F N note down the leveling difference as Up(2),Up(3), ... Up(N),
Single-floor down from F（N-1）to F l, note down the leveling difference as Dn(N-1),...Dn(2),Dn(1),

1) Calculate the respective leveling difference of the floors,

X(2) = (Up(2) + Dn(2)) / 2;
X(3) = (Up(3) + Dn(3)) / 2;
X(4) = (Up(4) + Dn(4)) / 2;
...
X(N-1) = (Up(N-1) + Dn(N-1)) / 2;

2) Calculate the current difference value on average XUp, XDn excluding those to the terminal landings

Difference value on average going up, XUp = (Up(2) + Up(3) + ... + Up(N-1)) / (N-2);
Difference value on average going down, XDn = (Dn(2) + Dn(3) + ... + Dn(N-1)) / (N-2);
Intermediate position, pX = (XUp - XDn) / 2;
Note that XUp, XDn and pX are all calculations with "+/-" marks.

3) Adjust F56, F57:

F56 = 50 - pX;
F57 = 50 - pX;

4) Make fine leveling adjustment and note down the data in fine adjustment for Fn as L(n):

L(2) = 20 - X(2)
L(3) = 20 - X(3)
...
L(n) = 20 - X(n)
...
L(N-1) = 20 - X(N-1)

Finally calculate the value in fine adjustment for the terminal landings.

☆Reasons for Poor leveling adjustment:

The following issues are summed up. Please check in turn:

1. If the following parameters are set improperly, the leveling can not be adjusted well.

Inspect F21 (adjustment of the leveling sensor will be delayed). Factory default setting: 6 mm. The elevator can be set to 6mm using the photoelectric leveling sensor below the speed of 1.75m/s.

High-speed elevators (3.0m/s or above) can be set to 10mm using the photoelectric leveling sensor.

High-speed elevators (5.0m/s or above) can be set to 16mm using the photoelectric leveling sensor.

F56 leveling adjustment of up motion. Factory default setting: 50 mm.

F57 leveling adjustment of up motion. Factory default setting: 50 mm.

Leveling fine tuning：The Leveling fine tuning on every floor is set to factory default setting 20 mm.

2. Encoder interference

1) The encoder shielding line accepts a disturbance of power line because it is not grounded or the signal line and power line are not separated. This problem is more serious at the synchronous motor scene. The signal of the Sincos encoder or rotary transformer is small analog signal, and is more vulnerable to interference. It is shown as the random and erratic non-leveling.

2) Inspection method: Record the elevator shaft data after self-tuning (from down station to up station), ,then restart self-tuning and record shaft data accordingly. Compare these data collected during the self-tuning. The position error of corresponding floors is no more than 3 mm. (Generally they are the same or the difference is + -1mm) It is considered as the encoder interference or traction sheave slippage when the error is more than 3 mm.

3) Solutions:

a) Make sure the electrical grounding line has been connected from the motor to the control cabinet.

b) Make sure the shielding line of PG card from the encoder to the transducer has been grounded at the transducer end. Check whether there is a connection between the cable terminations; if so, make sure that both ends of the shielding line are grounded.

Warning: Special attention should be given to the middle joins of Sincos encoder line of the synchronous motor!!

c) Make sure the encoder line from PG card to encoder line of the main-board has been grounded

d) Make sure the encoder line is far away from the power line and break resistor line (the encoder line should be covered with flexible conduit if they are in the same wireway)

e) Make sure it is connected from PG card 0V to the main-board 0V. (Particularly when A +, A-, B +, B- ouput is used at multi-segment speeds)

f) Inspect whether the encoder coupling shaft slips.

3. Slippage of the traction sheave's steel wire rope

1) Phenomenon: The leveling is not correct when the elevator runs with no-load or full-load, or when the up and down leveling is inconsistent. It is accurate when it runs at half-load.

2) Inspection method: On any floor(Assumption it is the third floor)，mark signal line with chalk between the traction sheave and the rope. Return to the third floor after runing single round-trip (from the third floor to the

fourth floor, from the fourth floor to the third floor). Check error distance between signal line of traction sheave and rope (requested less than 5 mm); this error is the single slippage distance error. Run 2 times when there is Slippage error in the no-load and full-load situation. Slippage error which is greater than 5 mm must be resolved.

3) Solutions:

a) Before and after the car decoration it may vary around 200 Kg. Is Car decoration completed now? Is the current balance coefficient right? If we can not confirm console cabinet load to half load, Ping-error?

b) High-speed elevators can not solve the slippage problem, the following two approaches are:

1. Install the encoder at the side of the governor to offer the position feedback of the main-board.

2. Absorp the slippage error by creeping. Set F24 = 2(Analog with creep) or F24 = 0(Multi-speed operation)

4. Speed regulator overshooting

DC speed regulator or synchronous motor with no gear may overshoot because of having no reducer, especially Mentor II DC governor. It uses the encoder to feedback and the characteristic is soft. Recommend the use of guns generators. Do not band brake at zero rate before parking, and then another rate, have non-zero-speed band brake for the Performance.

1) Inspection method: Check the elevator band brake situation when it is parked. If it is found that speed of elevators slow down to zero, escalators do not have a band brake, and then begin to have speed, and then hold the band brake with speed, which shows that the elevator has overshoot.

2) Solution: Adjust PI parameters of the governor speed loop PI to eliminate the overshoot data.

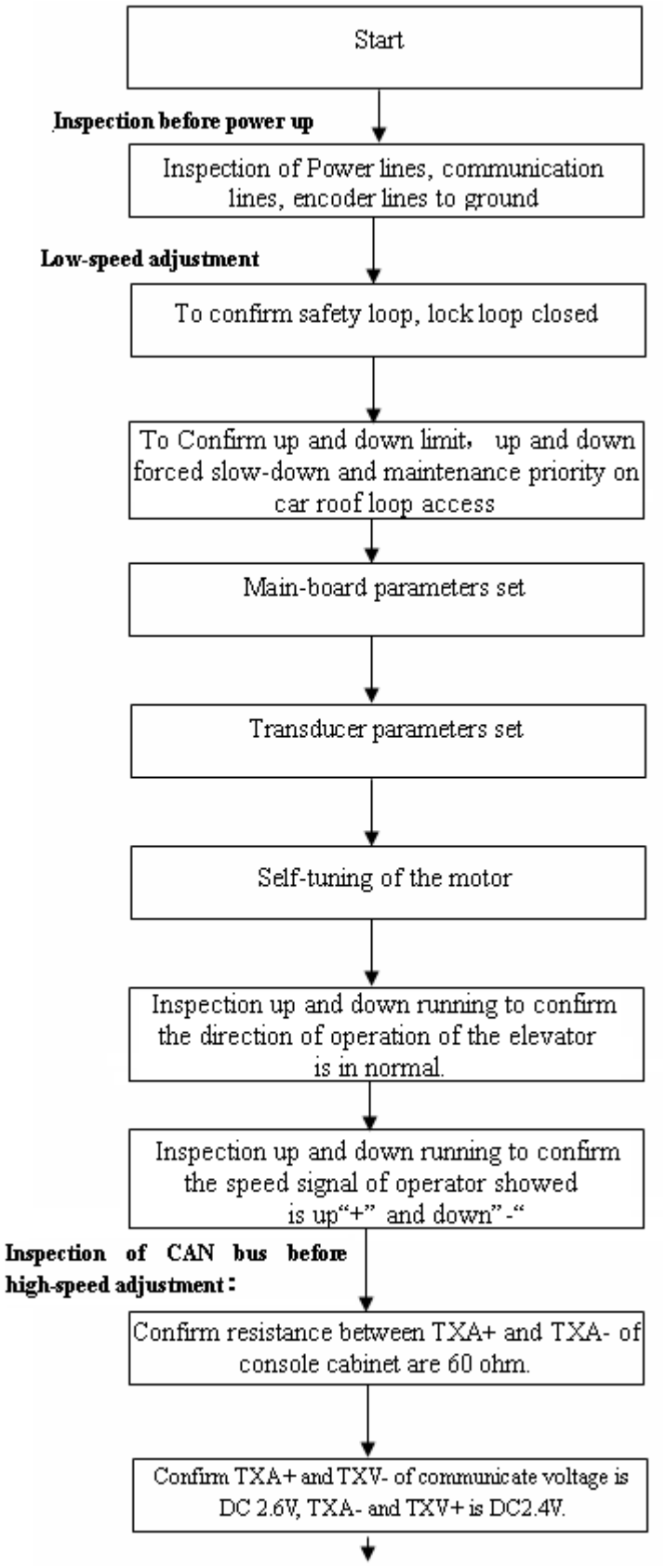
5. Ensure adequate insertion depth when using the magnetic reed sensor. Check whether the leveling insert plate on each floor is inserted into the red line of sensor, and flashboard on each floor is installed tilt.

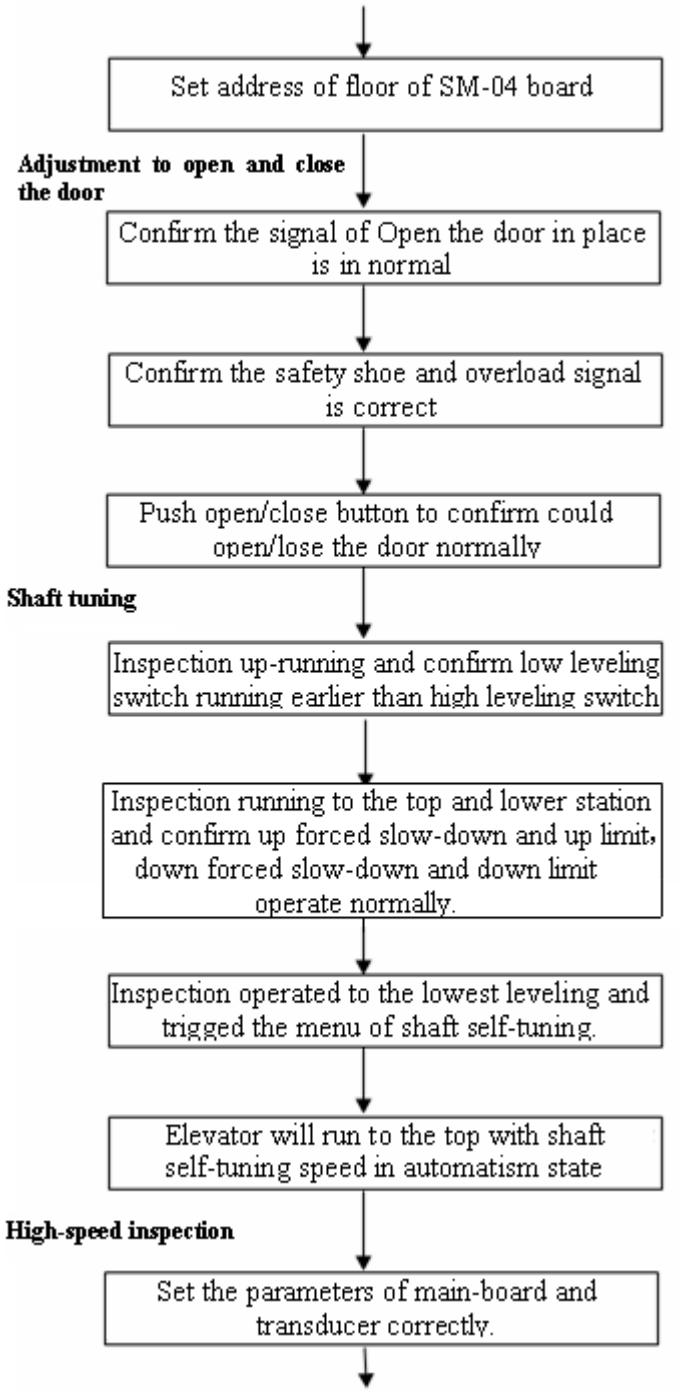
6. When the length of leveling insert plate is inconsistent, flashboard on the second floor is the length of the benchmark. The length of flashboard on other floors requirements to be the same with the second floor, otherwise may cause problems of flashboard.

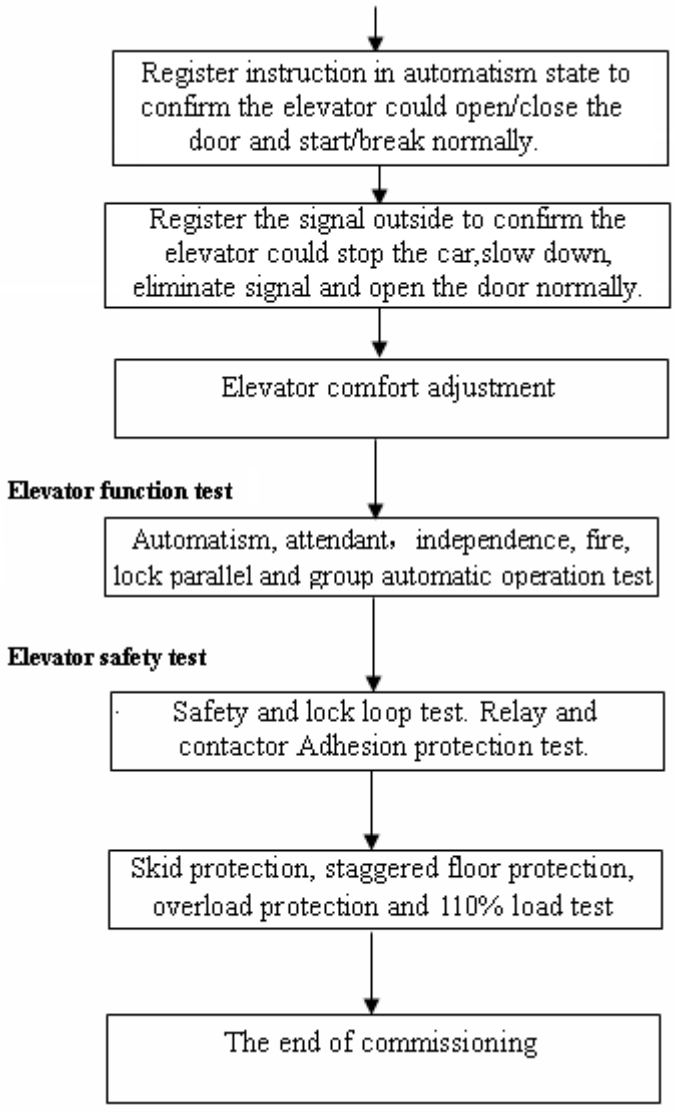
7. Does not do self-tuning again after adjusting the flashboard

4.10 Simple commissioning diagram

Commissioning Process




Set address of floor of SM-04 board
Adjustment to open and close the door
Confirm the signal of Open the door in place is in normal
Confirm the safety shoe and overload signal is correct
Push open/close button to confirm could open/lose the door normally
Shaft tuning
Inspection up-running and confirm low leveling switch running earlier than high leveling switch
Inspection running to the top and lower station and confirm up forced slow-down and up limit, down forced slow-down and down limit operate normally.
Inspection operated to the lowest leveling and trigged the menu of shaft self-tuning.
Elevator will run to the top with shaft self-tuning speed in automatism state
High-speed inspection
Set the parameters of main-board and transducer correctly.


Register instruction in automatism state to confirm the elevator could open/close the door and start/break normally.
Register the signal outside to confirm the elevator could stop the car,slow down, eliminate signal and open the door normally.
Elevator comfort adjustment
Elevator function test
Automatism, attendant, independence, fire, lock parallel and group automatic operation test
Elevator safety test
Safety and lock loop test. Relay and contactor Adhesion protection test.
Skid protection, staggered floor protection, overload protection and 110% load test
The end of commissioning

Chapter V Trouble Diagnosis

5.1 A List of Error Codes

Code	Description	What causes the breakdown or errors
02	The Lock Drops off in Operation (Emergency Stop)	The lock is missing in operation although the safety circuit is there.
03	The Up Limit Switch Drops off	Both Up and Down Limit switches activated at the same time while the car is NOT on the top floor at all during normal service.
		The Up Limit switch drops off during a travel upward.
04	The Down Limit Switch Drops off	Both Up and Down Limit switches activated at the same time while the car is NOT on the lowest floor at all during normal service.
		The Down Limit switch drops off during a travel downward.
05	Failure in Opening the Door Lock	The door fails to open fully in 15 seconds, during which the door-opening signal has kept coming (exclusive of lack of door-lock signals), the error is recorded if this is the case for three times continually.
		The landing door lock is bridged when the lift is in the door zone with door-lock signals and door-open limit signal (for 1.5 s) but without car door lock signal（only valid with high-voltage input of separate door）
06	Failure in Closing the Lock	The door fails to close properly in 15 seconds, during which the door-closing signal has kept coming (exclusive of lack of door-lock signals), the error is recorded if this is the case for eight times continually.
		If the door-close limit signal disagrees with the door-lock position for 4 seconds on end (exclusive of lack of door-lock signals), it is regarded as overtime in door closing. The error will be recorded if it has occurred eight times.
08	CANBUS Failure	Interference in communication.
		The resistor jumper is NOT yet connected on the terminals.
		Break-off in communication.
		The error will be recorded if the communication with car control PCB SM-02 stays in failure for 4 s incessantly.
09	Inverter Failure	An inverter error appears at input Port X11 while the master control PCB is at work properly for 10 seconds, which will be recorded error.

10	Positioning Errors of Deceleration Switches 1 for Going-up	Check when power on or after the self-learning travel: the deceleration switch for single-floor up is positioned higher than 3/5 of the rise of the top floor.
		Check when power on or after the self-learning travel: the deceleration switch for single-floor up is positioned lower than the shortest decelerating distance.
		Check in lift operation: the deceleration switch for single-floor up is positioned 100 mm lower than the one positioned for self-learning.
		Check in lift operation: the deceleration switch for single-floor up is positioned 150 mm higher than the one positioned for self-learning.
		Check when the lift is stopped: the deceleration switch for single-floor up is positioned 100 mm lower than the one positioned for self-learning.
		Check when the lift is stopped: the deceleration switch for single-floor up is positioned 150 mm higher than the one positioned for self-learning and it fails to activate.
		When in automatic control，up deceleration switch and down deceleration switch are activate at the same time but the lift is not at the top floor
11	Positioning Errors of Deceleration Switches 1 for Going-down	Check when power on or after the self-learning travel: the deceleration switch for single-floor down is positioned lower than 3/5 of the rise of the top floor.
		Check when power on or after the self-learning travel: the deceleration switch for single-floor down is positioned higher than the shortest decelerating distance.
		Check in lift operation: the deceleration switch for single-floor down is positioned 100 mm higher than the one positioned for self-learning.
		Check in lift operation: the deceleration switch for single-floor down is positioned 150 mm lower than the one positioned for self-learning.
		Check when the lift is out of service: the deceleration switch for single-floor down is positioned 100 mm higher than the one positioned for self-learning.
		Check when the lift is stopped: the deceleration switch for single-floor down is positioned 150 mm lower than the one positioned for self-learning and it fails to activate.
		When in automatic control，up deceleration switch and down deceleration switch are activate at the same time but the lift is not at the bottom floor.
12	Positioning Errors of Deceleration Switches TWO for Going-up	Check when power on or after the self-learning travel: the deceleration switch for double-floor up is positioned higher than 3/5 of the rise of the floor, in which it is located.
		Check in lift operation: the deceleration switch for double-floor up is positioned 150 mm lower than the one for double-floor up positioned for self-learning.
		Check in lift operation: the deceleration switch for double-floor up is positioned 250 mm higher than the one for double-floor up positioned for self-learning.

		Check when the lift is stopped: the deceleration switch for double-floor up is positioned 150 mm lower than the one for double-floor up positioned for self-learning.
		Check when the lift is stopped: the deceleration switch for double-floor up is positioned 200 mm higher than the one for double-floor up positioned for self-learning and it fails to activate.
		Only one-step deceleration switches are installed but set as two-step deceleration switches (See F182).
13	Positioning Errors of Deceleration Switches TWO for Going-down	Check when power on or after the self-learning travel: the deceleration switch for double-floor down is positioned lower than 3/5 of the rise of the floor, in which it is located.
		Check in lift operation: the deceleration switch for double-floor down is positioned 150 mm higher than the one for double-floor up positioned for self-learning.
		Check in lift operation: the deceleration switch for double-floor down is positioned 250 mm lower than the one for double-floor down positioned for self-learning.
		Check when the lift is stopped: the deceleration switch for double-floor down is positioned 150 mm higher than the one for double-floor down positioned for self-learning.
		Check when the lift is stopped: the deceleration switch for double-floor down is positioned 200 mm lower than the one for double-floor down positioned for self-learning and it fails to activate.
		Only one-step deceleration switches are installed but set as two-step deceleration switches (See F182).
20	Protection against Slippage	The leveling switch fails to function in travel (excluding inspection service) beyond the delay set by F62.
21	Overheat in Motor	An input signal appears on the overheat input (X25).
22	Motor Rotation Reversed	Slippage due to reversed rotation continues for more than 0.5 s with speed feedback <-150 mm during upward travel and >150 mm during downward travel respectively (from Port A and B in reversed order on master control PCB).
23	Over-speeding	If the value of feedback exceeds the permitted speed for 0.1 s, Error 23 is recorded. If the reference speed is under 1.0 m/s, the permitted speed = 0.25 m/s + Reference Speed. If the reference speed is over 1.0 m/s, the permitted speed = 1.25 x Reference Speed. Max. permitted speed < 1.08 x Rated Speed
		At both terminal landings, the lift slows down by deceleration 0.8m/s^2. If the speed feedback exceeds the deceleration for 0.1 s, Error 23 is recorded.

24	Under-speeding	If the value of feedback goes under the permitted speed for 0.5 s, Error 24 is recorded. If the reference speed is under 1.0 m/s, the permitted speed = Reference Speed - 0.25m/s. If the reference speed is over 1.0 m/s, the permitted speed = 0.5 x Reference Speed.
27	Failure in Up-leveling Switch	The up-leveling switch fails to work after the lift slows down ready for stop.
		If the up-leveling switch overrides the max. Effective or the ineffective distance in protection, Error 27 is recorded. If the length of the leveling vane < 300 mm, the max. Effective distance in protection = 4 x 300 mm. If the length of the leveling vane > 300 mm, the max. Effective distance in protection= 4 x Length of the Leveling Vane. If the max. Number of floors < 3, the max. Ineffective distance in protection = 1.5 x the Greatest Distance between Floors. If the max. Number of floors > 3, the max. Ineffective distance in protection = 2.5 x the Greatest Distance between Floors.
28	Failure in Down-leveling Switch	The down-leveling switch fails to work
		If the down-leveling switch overrides the max. Effective or the ineffective distance in protection, Error 28 is recorded. If the length of the leveling vane < 300 mm, the max. Effective distance in protection = 4 x 300 mm. If the length of the leveling vane > 300 mm, the max. Effective distance in protection = 4 x Length of the Leveling Vane. If the max. Number of floors < 3, the max. Ineffective distance in protection = 1.5 x the Greatest Distance between Floors. If the max. Number of floors > 3, the max. Ineffective distance in protection = 2.5 x the Greatest Distance between Floors.
32	Safety Circuit Breaks off	The safety circuit breaks off when the lift runs in service.
34	Input Contactor Contact Stuck-up	No output from relay KMC on master control PCB, but an input signal is detected by terminal detecting (a stuck-up in KMC contactor).
		An output from relay KMC on master control PCB is detected, but no input signal is detected by terminal detecting (closing-up failure in KMC contactor).
35	Brake Contactor Contact Stuck-up	No output from brake contactor KMB on master control PCB, but an input signal is detected by terminal detecting (including the two detecting terminals in the rear).

		An output from brake contactor KMB on master control PCB is detected, but no input signal is detected by terminal detecting(including the two detecting terminals in the rear).
36	Output Contactor Contact Stuck-up	No output from relay KMY on master control PCB, but an input signal is detected by terminal detecting (a stuck-up in KMY contactor).
		An output from relay KMY on master control PCB is detected, but no input signal is detected by terminal detecting (closing-up failure in KMY contactor).
37	Door-lock Contact Stuck-up	The signal of door-opening position limit works and the door-lock signal is detected.
38	Brake Switch Failure	An output from relay KMB on master control PCB is detected，but brake switch is not open.
39	Contact Failure in Safety Circuit Relays	The safety relay fails to close up due to damage.
		The safety relay gets stuck up.
		The safety circuit input signal differs from contact testing.
		Damage to the high-voltage port of the safety circuit on master control PCB.
		The high-voltage terminal detection of safety circuit disagrees with the detecting signal of safety relays (if F156=0).
40	Inverter Failure	In spite of direction signal and operation output, the inverter’s operational signal gets no feedback.
		Although there are Run output and Enable output, the inverter’s operational signal gets no feedback.

5.2 Several instruction for reset methods

1 Automatic reset: It is indicated that elevator can continue to operate normally if only it meets normal operation situation after peripheral fault phenomena releasing.

2 Inspection reset: it is indicated that elevator can continue to operate only if the maintenance switch actions once after peripheral failure phenomena releasing (also including the mainboard power off).

3 Inspection reset and self-turning: Elevator can continue to operate in the failure condition, and the running elevator have to make a self-turning to continue operating.

4 Power off reset: Once these failures occur, the elevator is out of action immediately and then the mainboard shall be reset after power off.

ADDENDUM

I. CD/A board seven segment digital tube, usage of key-press

I.1 Introductions for appearance and functions

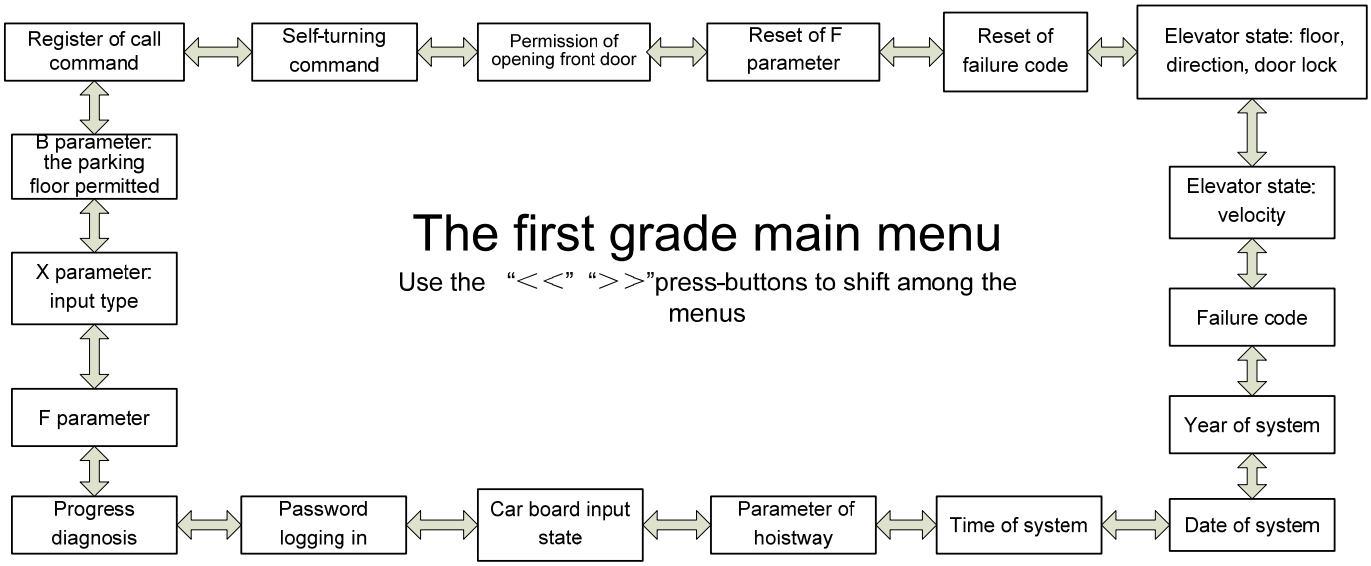
Figure I.1 LED, press-button drawing of partial enlargement

Press-button	Press-button name	Function
	Up press-button	1. Upper shift one item when browsing menu 2. Add one to the current digit when inputing data
	Down press-button	1 Downward shift one item when browsing menu 2. The current digit decreases one when inputing data
	Left press-button	1.Left shift one menu when selecting function 2.Left shift cursor when inputing data
	Right press-button	1.Right shift one menu when selecting function 2.Right shift cursor when inputing data
	Esc press-button	1. Cancel input when inputing data
	Enter press-button	1.Modify parameter when browsing parameter 2.When inputing data, save it

Table I.1 Instruction of press-button functions

I.2 Menu configuration

Main menu configuration is shown in the following figure 2, due to the limits of configuration of seven segment code and press-button, the operation interface applies the configuration of first grade menu.

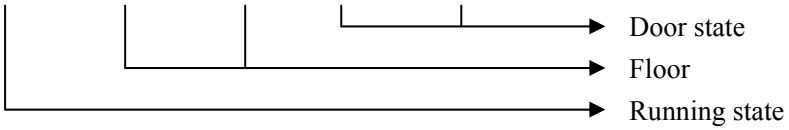


FigureI.2 Menu configuration

Use the left and right press-buttons to shift among the menus.

I.3 Display of each menu

1．Menu of elevator state

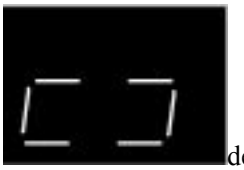


In this menu, you can see the basic states of elevator, including running state, current floor and door state. During the running state:

 denotes that the elevator is running up,  denotes that the elevator is running down,  denotes that the elevator stops.

All floors are denoted in two-digit decimal numeral.

During the door state:

 denotes that the door is open ,  denotes that the door has been fully opened,

 denotes that the door is closing ，  denotes that the door has been fully closed.

2. Menu of elevator velocity

This menu shows the current running velocity of elevator in m/S. The current velocity is 1.75m/S, as it shows above.

3. Menu of self-turning command

When entering the menu, it shows as above.

Self-turning command

When self-turning, press the "Enter" button, the last digit begins to flash; press the "up" button, then the zero changes to one, press "Enter" again to affirm, as it shows above, the elevator begins self-turning.

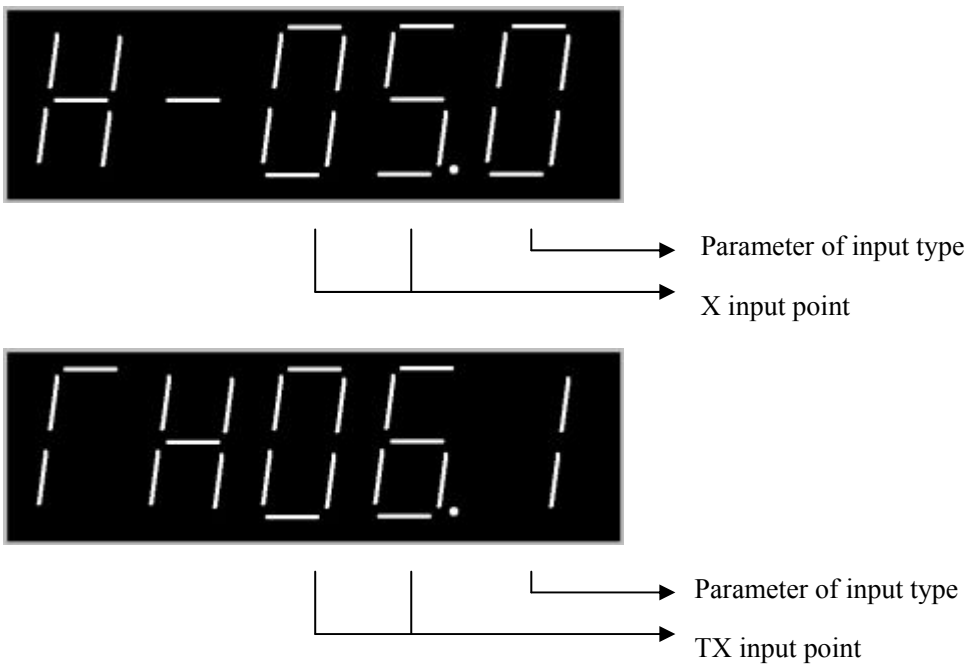
4. Menu of register command

Press "Enter", the floor digit begins to flash. Use the "up" and "down" buttons to select the floor to be inputted command, press "Enter" again to affirm. So the command can be done.

5. B parameter, menu of setting of parking floor permitted

Use the "up" and "down "buttons to select the floor to be modified, please take notice that the floor herein is actual floor (or control floor).Press "Enter", the parameter begins to flash, use the "up" and "down " buttons to set the parameter, then press "Enter" again to affirm, where the "1"denotes permitting to park, "0"denotes forbidding to park.

6. X parameter, the selection menu of input type



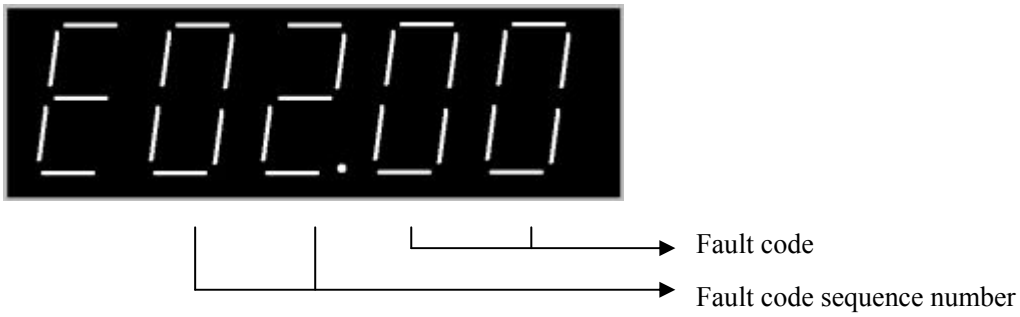
Use the "up" and "down" buttons to select X or TX input points to be modified. Press "Enter", the parameter begins to flash, use the "up" and "down " buttons to set the parameter, then press "Enter" again to affirm, wherein the "1"denotes normally closed contact, "0"denotes normally opened contact. Notes: due to the limit of seven segment code, the "T" and "X" in CD/A are all as the figure above, wherein the showing "X" is similar to "H", do not mistake it.

7. Menu of browsing and modifying of F parameter

Because the F parameters are so many that the sequence number of parameter should be displayed in three-digit. Moreover, parameter itself needs several digits to display. So it uses the special alternate display method to show F parameter. The operation is as follows: Use the "up" and "down" buttons to select the parameter browsed. Such as F3, the screen will show "F-003" as above, after one second, the screen shows the value of F3 parameter 1.10 in "1.100" as you see on the figure above. Later, "F-003" and "1.100" show alternately, each for on second.

The F parameter can be only modified when having login authority， if having no login authority, when modifying parameter, press "Enter" button, it will turn to "Login" menu.

8. Display menu of fault code



CD/A can store 20 fault codes. The nearest fault code sequence number is 00. Use the "up" and "down" buttons to browse these fault codes.

Press the "ENTER" button, turn to the following menu, use the "left" and "right" buttons to check the date, floor, and time of fault occurring:

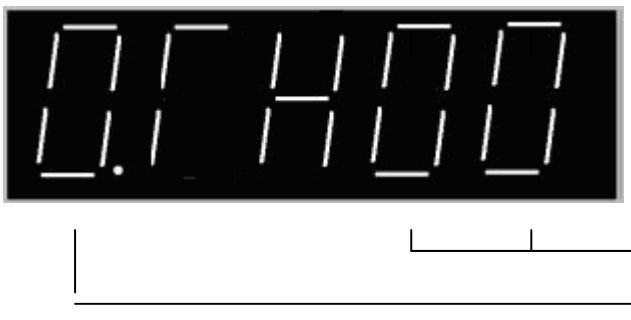
Date: The meaning of figure above is that the fault occurs on Nov. 20. "d "is the abbreviation of Day.

Floor: The meaning of figure above is that the fault occurs on 12th floor. "Flr" is the abbreviation of Floor.

Time: The meaning of figure above is that the fault occurs at 14:50. "T "is the abbreviation of Time.

Notes: Please properly set the mainboard time, so that it can show the correct fault time.

9. I/O status menu



The meaning of figure above is that TX0 shows having no input. Use the "up" and "down" buttons to select TX sequence number whose range is from 0 to 23. After selecting the TX sequence number, the highest order indicates whether having the valid input at the input terminal or not (zero denotes having no valid input, while one denotes having valid input).

Notes: This only browses the parameter herein, the meaning is different from setting the X parameter type where 0 denotes normally open and 1 denotes normally closed.

10. Login menu

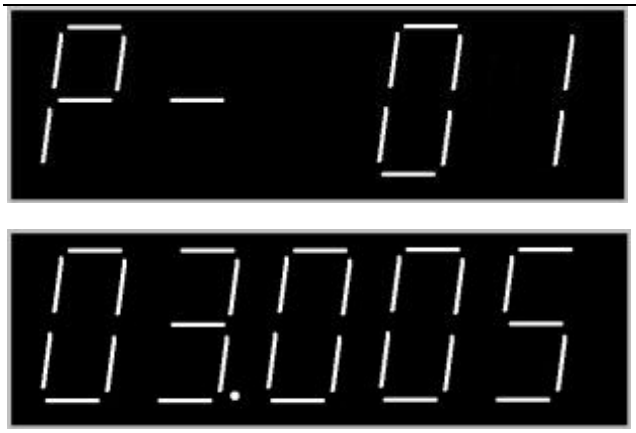
Press "Enter" into menu, then it displays as follows:

Input the password, the password is 149 as the figure shows.

During entering into the menu, you will see "login ". Press "Enter", the lowest order of LED begins to flash, use the "up" and "down" buttons to select this digit. Use the "left" and "right" buttons to select the position where it requires to input digit, the chosen digit begins to flash, it means entering into input status, use the "up" and "down" buttons again to select the digit required. When finishing the password input, press "Enter" to complete login. If the password is correct, it will display "login" after pressing "Enter". If the password is wrong, it will remain at the password input status after pressing "Enter", if you want to quit from the status, you can press "ESC" to quit.

Notes: In the case of not login, you can only browse the status and parameter of elevator. Only when you login, you have the authority to modify the parameters.

11. Menu of hoistway parameter



Because the P hoistway parameters are so many that the sequence number of parameter should be displayed in three-digit. Moreover, parameter itself needs several digits to display. So it uses the special alternate display method to show P hoistway parameters. The operation is as follows: Use the "up" and "down" buttons to select the parameter browsed. Such as P1, the screen will show "P- 01" as above, after one second, the screen shows the value of P3 parameter 3.005 in "03.005" as you see on the figure above. Later, "P- 01" and "03.005" show alternately, each for on second.

The signification of each parameter as follows:

Number	Signification
1-32	Floor hoistway data of floor 1-32
33	Length of Leveling flashboard
34	Leveling switch center distance
35	Distance of up slow down switch on floor 1
36	Distance of up slow down switch on floor 2
37	Backup
38	Backup
39	Distance of down slow down switch on floor 1
40	Distance of down slow down switch on floor 2
39	Backup
40	Backup

12. Menu of progress diagnosis

This menu shows the current status of elevator by the ways of a two-digit status code. The signification of status code as follows:

Sequence number	**Instruction**
0	Safety loop power off
1	Elevator fault
2	Overheat of motor
3	Overload of elevator
4	Safety shoe action
5	Press-button action of opening door(door open button or cocurrent local call button action)
6	Lock short circuit/Door open limit actuates
7	Opening elevator door
8	Closing elevator door
9	Door close limit actuates
10	Up limit
11	Down limit
12	Door lock closed, conforms to running condition
13	Kmy contact detecting
14	BY contact detecting
15	Zero speed servo
16	Non-stop elevator
17	Running elevator
18	Elevator door lock power off
19	No-completing hoistway learning
20	Detection transducer enable

13. Year of system

The meaning of figure above is 2000 year. "Y" is the abbreviation of Year. When modification required, press "Enter", the lowest order of digit begins to flash. Use the "left" and "right" buttons to select the position where

modification required, the chosen digit begins to flash. Then use the "up" and "down" buttons to modify digit, press "Enter" to affirm modification.

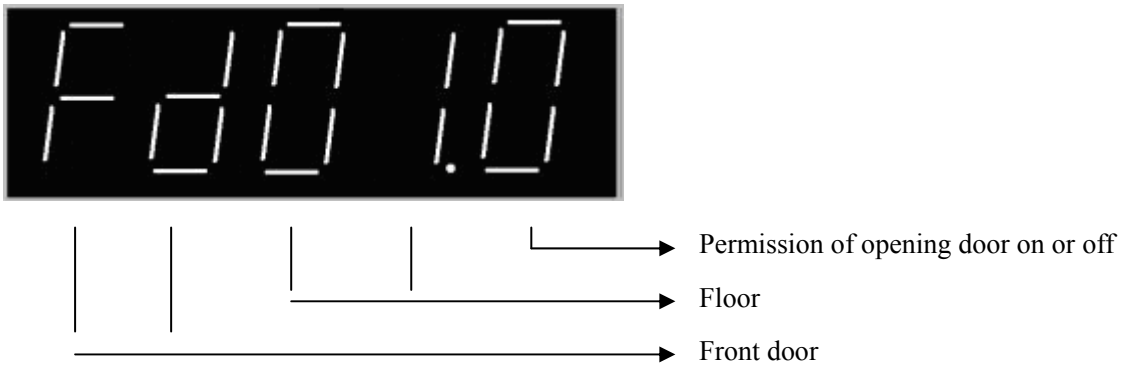
14. Date of system

The meaning of figure above is Nov 20. "d" is the abbreviation of Day. When modification required, press "Enter", the lowest order of digit begins to flash. Use the "left" and "right" buttons to select the position where modification required, the chosen digit begins to flash. Then use the "up" and "down" buttons to modify digit, press "Enter" to affirm modification.

15. Time of system

The meaning of figure above is 10:50. "T" is the abbreviation of Time. Notes that due to the limit of seven segment code, the "T" in CD/A is shown as above. When modification required, press "Enter", the lowest order of digit begins to flash. Use the "left" and "right" buttons to select the position where modification required, the chosen digit begins to flash. Then use the "up" and "down" buttons to modify digit, press "Enter" to affirm modification.

16. Permission of opening front door



The meaning of figure above is permission of opening front door of shielding floor 1. "Fd" is the abbreviation of Front Door. Press "up" and "down" buttons to browse permission parameter of opening front door of corresponding floor. When modification required, press "Enter", the lowest order of digit begins to flash. Use the "left" and "right" buttons to select the position where modification required, the chosen digit begins to flash. Then use the "up" and "down" buttons to modify digit, press "Enter" to affirm modification (0 denotes to shield the function of permission of front door open, while 1 denotes to activate the function of permission of front door open).

17. Reset of F parameter

This menu implements reset of F parameter. Notes: the reset of F parameter shall be only in effect when the login grade is equal to grade 2 or more. When the login grade is not high enough, press "Enter" key, it have none effect. But if the login grade complies with the requirement, press "Enter" key, you will enter into input menu of authentication code (setting authentication code is to avoid mistaken operation, the authentication code is fixed to 5678). If the authentication code is correct, after pressing "Enter" key, it will reset the F parameter.

18. Reset of fault code

This menu implements reset of fault code. Notes: the reset of fault code shall be only in effect when the login grade is equal to grade 2 or more. When the login grade is not high enough, press "Enter" key, it have none effect. But if the login grade complies with the requirement, press "Enter" key, you will enter into input menu of authentication code (setting authentication code is to avoid mistaken operation, the authentication code is fixed to 5678). If the authentication code is correct, after pressing "Enter" key, it will reset the fault code.

I.4 Graphic example of LED display digit and letter

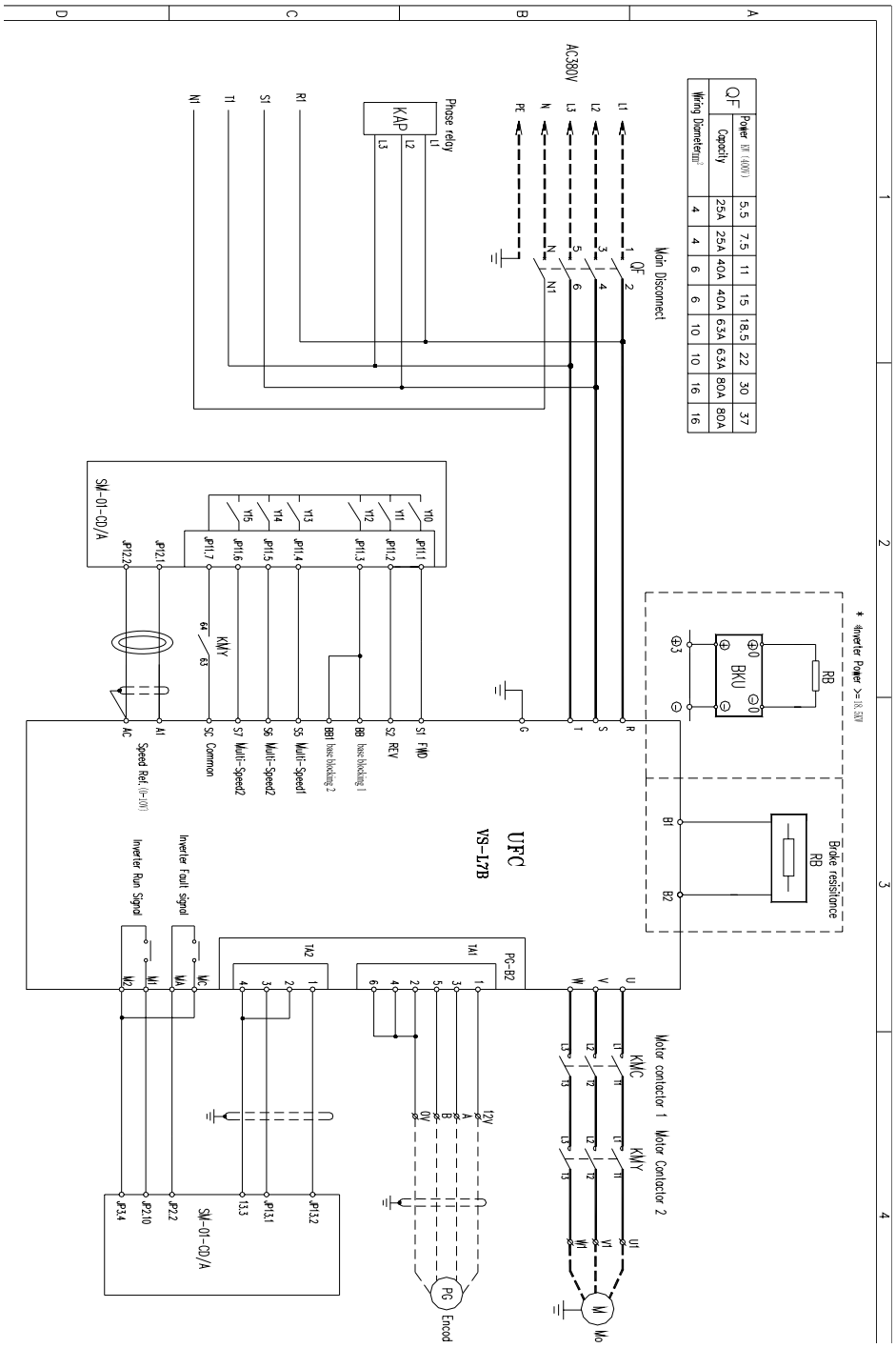
Due to the structural restriction of LED, some of the display digit and letter may be difficult to read, so we give the comparison table of display figure and signification as follows:

Display	signification	Display	signification	Display	signification	Display	signification
	1		2		3		4
	5		6		7		8
	9		0		A		B
	C		D		E		F
	I		L		N		O
	P		R		T		U
	X		Y				

II. Lists of Inverter Parameters

II.1 Yaskawa Inverter G7

□ Wiring Diagram



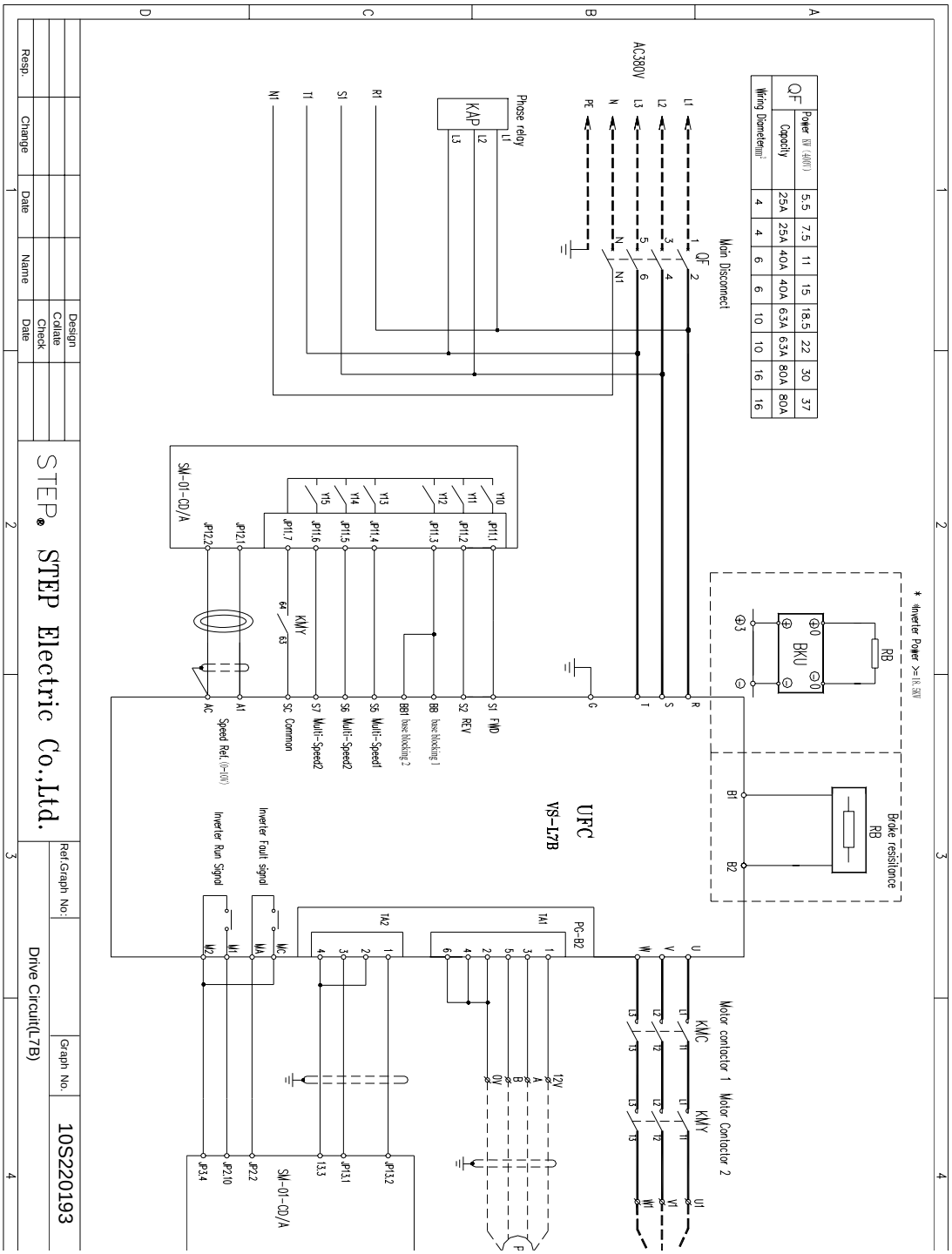
□ A List of Parameters (G7)

Function Code	Description	Parameter value		Remarks
		analogy	digital	
A1-00	Language in display	0*	0*	
A1-01	User priority for parameters	2	2	
A1-02	Mode of control	3*	3*	2 for open loop
B1-01	Speed reference	1*	0*	0 for multi-stage speed reference
B1-03	Way of stop	1*	1*	
C1-01	Acceleration time 1	0*	2.5**	
C1-02	Deceleration time 1	0*	2.5**	
C1-09	Emergency stop time	1*	1*	
C2-01	Acceleration initial jerk	0*	1.2*	
C2-02	Acceleration end jerk	0*	0.8*	
C2-03	Deceleration initial jerk	0*	0.8*	
C2-04	Deceleration end jerk	0*	1.0*	
C5-01	ASR ratio increment 1	15**	15**	
C5-02	ASR integral time 1	0.5**	0.5**	
C5-03	ASR ratio increment 2	40**	40**	
C5-04	ASR integral time 1	0.5**	0.5**	
C5-07	ASR switching frequency	10**	10**	
C6-02	Carry frequency	15**	15**	
D1-01	Frequency directory 1	0	0	
D1-02	Frequency directory 2	0	0	
D1-03	Frequency directory 3	0	0	
D1-04	Frequency directory 4	0	1.5**	creeping speed
D1-05	Frequency directory 5	0	10.0**	inspection speed
D1-06	Frequency directory 6	0	30**	single-floor speed
D1-07	Frequency directory 7	0	40**	double-floor speed
D1-08	Frequency directory 8	0	50**	multi-floor speed
E1-01	Voltage of power supply input	400**	400**	
E1-04	Max frequency of output	50**	50**	
E1-05	Max voltage	380**	380**	
E1-06	Base frequency	50**	50**	
E1-09	Min frequency of output	0*	0*	
E2-01	Rated current of motor	Parameters for motor Self-learning	Parameters for motor Self-learning	refer to brand label on motor
E2-02	Rated difference in rotation of motor			refer to brand label on motor
E2-03	Motor current on empty load			35-40% of the rated current
E2-04	Polarities of motor			refer to brand label on motor
E2-05	Resistance between motor wirings			
E2-06	Electric leakage of motor			
E2-07	Core satiation factor 1 of motor			
E2-08	Core satiation factor 2 of motor			
E2-09	Mechanical loss of motor			

Function Code	Description	Parameter value		Remarks
		analogy	Digital	
E2-11	Rated capacity of motor			
F1-01	constant	600*	600*	refer to the encoder
F1-02	Act when PG break-off is detected	0*	0*	
F1-03	Act when over-speed is detected	0*	0*	
F1-04	Act when excessive deviation is detected	0*	0*	
F1-05	PG direction of rotation	0	0	
F1-06	PG ratio of frequency shunt	1	1	
F1-09	Time to detect over-speed	1*	1*	
F1-10	Criteria to detect over–speed	10	10	
F1-11	Time to detect excessive speed deviation	0.5	0.5	
F1-14	Act to detect PG break-off	2.0	2.0	
H1-01	Function of Terminal S3	24	24	
H1-02	Function of Terminal S4	14	14	
H1-03	Function of Terminal S5	F*	3	
H1-04	Function of Terminal S6	F*	4	
H1-05	Function of Terminal S7	F*	5*	
H1-06	Function of Terminal S8	9*	9*	to be set at 9 for base blocking
H1-07	Function of Terminal S9	F*	F*	
H3-01	Signal priority on Terminal A1	0	0	
H3-02	Input increment on Terminal A1	100**	100**	
H3-03	Input deviation on Terminal A1	0**	0	
H3-04	Signal priority on Terminal A3	0	0	
H3-08	Selection in signal priority on Terminal A2	2	2	
H3-09	Function on Terminal A2	1F*	1F*	
H3-10	Input increment on Terminal 14	100	100	
H3-11	Input deviation on Terminal 14	0	0	
H3-12	Time for analogical input filtering	0.03**	0*	
L3-04	Function selection against speed loss in deceleration	0*	0*	
E1-04	Max. output frequency	0	0	
T1-01	Mode of self-learning	0	0	
T1-02	Output capacity of motor			refer to brand label on motor
T1-03	Rated voltage of motor			refer to brand label on motor
T1-04	Rated current of motor			refer to brand label on motor
T1-05	Base frequency of motor			refer to brand label on motor
T1-06	Polarities of motor			refer to brand label on motor
T1-07	Rated rotations of motor			refer to brand label on motor
T1-08	Number of PG pulses for self-learning	600**	600**	

II.2 Siei Inverter(Synchronous)

□ Wiring Diagram



□ About Inverter Parameters (Siei Synchronous)

It is recommended in SIEI Instruction that HEIDENHAIN 1387 encoder should be used for PMS traction machines.

Description	Parameters	Remarks
Startup\Startup Config\Setup mode\Drive data		
Mains voltage	400V	
Ambient temp	40	
Switching freq	8KHZ	
Spd ref/fbk res	0.03125	For SIN/CO encoders
Startup\Startup Config\Setup mode\Moto data		
Rated voltage	___V	of motor
Rated current	___A	of motor
Rated speed	___rpm	Synchronous rotation of motor
Pole pairs	___Nm/A	（P=f*120/N）in motor
Torque constant	___V*s	torque/rated current
EMF constant	___Nm/A	0 for self-learning
Stator resist	**V*s	0 for self-learning
LsS inductance	**H	0 for self-learning
Startup\Startup Config\Autotune		
Startup\Startup Config\Loadsetup		
Startup\Startup Config\Mechanical data		
Travel unit sel	Millimeters	
Gearbox ratio	2:1	by reality
Pulley diameter	400mm	by reality
Full scale speed	235rpm	by reality
Startup\Startup Config\Weights		
Car weight	1200kg	
Counter weight	1650kg	
Load weight	1000kg	
Rope weight	300kg	
Motor inertia	0.1kg*m2	
Gearbox inertia	1kg*m2	
Startup\Startup Config\Landing zone		
Landing control	Disable	for pre-door-opening
Startup\Startup Config\Encoders config		
Speed fbk sel	Std encoder	
Std enc type	SinusoidalSinCos	SIN/CO encoders
Std enc pulses	2048ppr	
Std dig enc mode	FP mode	
Std enc supply	5.41/8.16V/	
Std sin enc Vp	0.5V	
Startup\Startup Config\BU protection		
BU control	Internal	Use external braking unit
BU resistance	___Ohm	External resistance in reality

BU res cont pwr	___	Capacity of external resistor in reality
Startup\Startup Config\Load default		
Startup\Startup Config\Load saved		
Startup\Save config		
Travel\Speed profile		
Smooth start spd	___mm/s	
Multi speed 0	___mm/s	
Multi speed1	75mm/s	half-speed for inspection
Multi speed 2	50mm/s	speed for re-leveling with the door open
Multi speed 3	50mm/s	for creeping
Multi speed 4	150mm/s	for inspection
Multi speed 5	1000mm/s	for single-floor
Multi speed 6	1500mm/s	for double-floor
Multi speed 7	2000mm/s	for multi-floor
Max linear speed	___mm/s	by system calculation
Travel\Ramp profile		
MR0 acc ini jerk	500rpm/s2	
MR0 acceleration	700rpm/s	
MR0 acc end jerk	800rpm/s2	
MR0 dec ini jerk	600rpm/s2	
MR0 deceleration	700rpm/s	
MR0 dec end jerk	500rpm/s2	
MR0 end decel	300rpm/s2	
Travel\Lift swquence		
Cont close delay	200ms	
Brake open delay	0ms	
Smooth start dly	0ms	
Brake close dly	200ms	
Cont open delay	200ms	
Door open speed	100mm/s	
Travel\Speed reg gains		
SpdP1 gain%	7%	for high speed
SpdI1 gain%	1.2%	for high speed
SpdP2 gain%	13%	for intermediate speed
SpdI2 gain%	3.2%	for intermediate speed
SpdP3 gain%	13%	for low speed
SpdI3 gain%	3.2%	for low speed
Spd 0 enable	Enable as start	
Spd 0 P gain%	16%	
Spd 0 I gain%	20%	
Sfbk der base	1000ms	
Sfbk der filter	5ms	
Prop filter	3ms	

Description	Parameters	Remarks
Travel\Speed thresholds		
Spd 0 ref thr	1rpm	
Spd o ref delay	100ms	
Spf 0 seed thr	0rpm	
Spd 0 spd delay	500ms	
SGP tran21 h thr	15%	
SGP tran32 I thr	1%	
SGP tran21 band	2%	
SGP tran32 band	2%	
Travel\Ramp function		
Ramp out enable	Enabled	Disable for analogical reference
Ramp shape	S-Shaped	
Travel\Speed setpoint		
Speed ref src/speed ref 1 src	LZ speed ref	for digital reference setting
Speed ref src/speed ref inv src	NULL/DOWN	with travel-down if set
Speed ref cfg/int speed ref 1	___rpm	Analogy can be adjusted by rotations in proportion to 10V
Travel\Save Parameters		
REGULATION PARM (To enter "service" menu requires password: 12345/18622)		
REGULATION PARM\Spd regulator\Spd regulator percent values		
SpdP1 gain%	9.99 %	
SpdI1 gain%	13.12 %	
REGULATION PARM\Spd regulator\Spd regulator base values		
SpdP base value	18A/rpm	View the range of setting by pressing SHIFT and then HELP.
SpdI base value	4600A/rpm/s	

1. Steps of self-learning

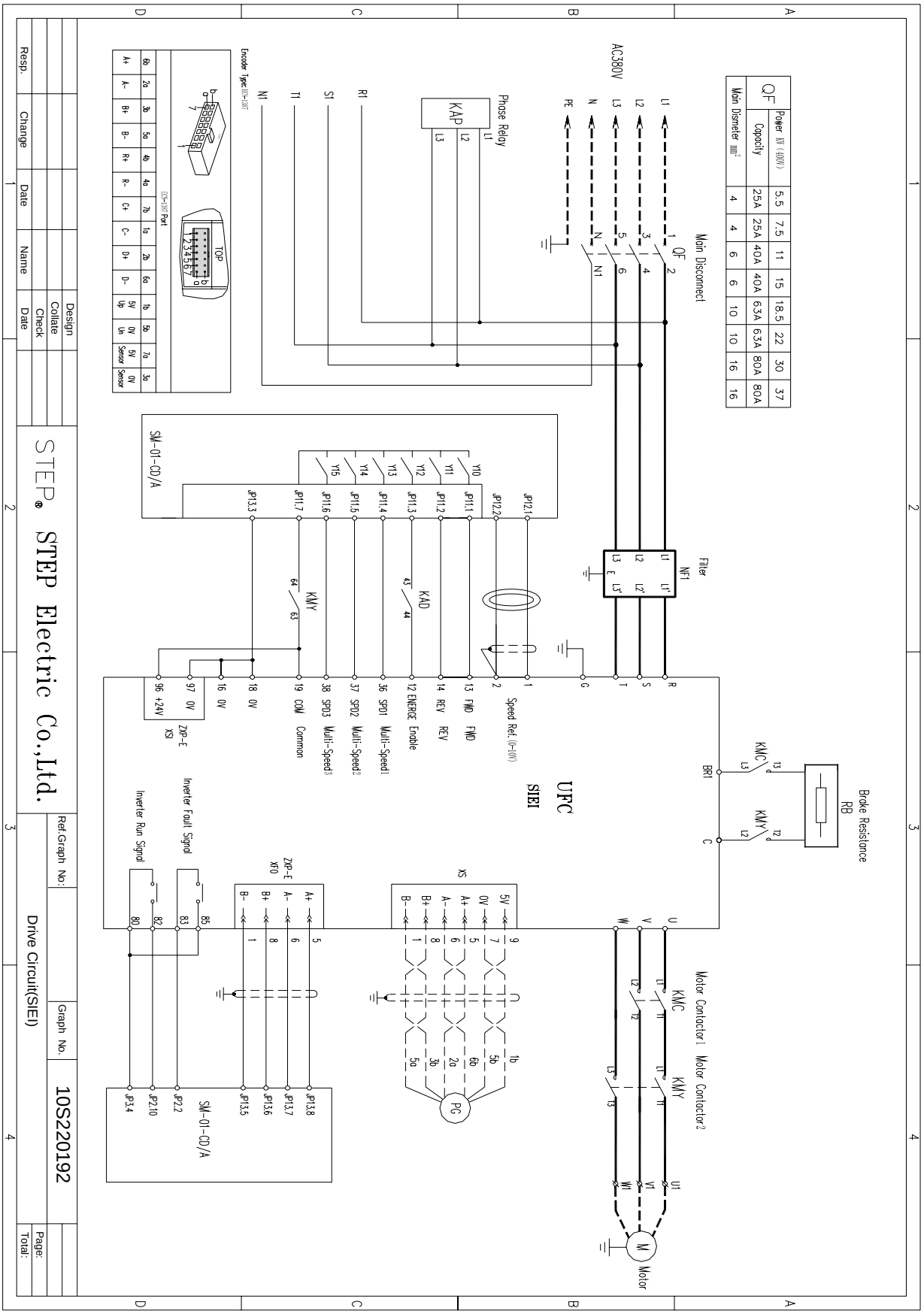
- ◆ Enter STARTUP/SETUP MODE/Autotune/Complete still;
- ◆ Have KMB,KMC,KMY closed when Press I key is on display, give Enable and Direction and press I Key on the inverter;
- ◆ With End on display, cancel Enable and Direction;
- ◆ Run Load setup.

2. Steps of Magnetic field phasing

- ◆ Enter REGULATION PAPAM\Flux config\Magnetiz config\Autophasing;
- ◆ Have KMB, KMC, KMY closed without traction ropes on, press Enter;
- ◆ With Waiting start ..... on display, give Enable and Direction;
- ◆ With Autophasing End on display, remove Enable and Direction and have KMB, KMC, KMY opened;
- ◆ Run Save config.

II.3 Siei Inverter(Asynchronous)

□ Wiring Diagram



□ A List of Parameters

Wiring of the encoder for a the asynchronous motor (SBH-1024-2MD Encoder is recommended)

	A	A-	B	B-	C	C-	0V	+5V
Encoder terminals of the inverter	Pin5	Pin 6	Pin8	Pin1	Pin 3	Pin 4	Pin 7	Pin9

Notes: If Phase C is available, Jumper S17 should be set as ON; if NOT, S17set as OFF. The parameters are the same as those for the synchronous motor except the part concerning the motor.

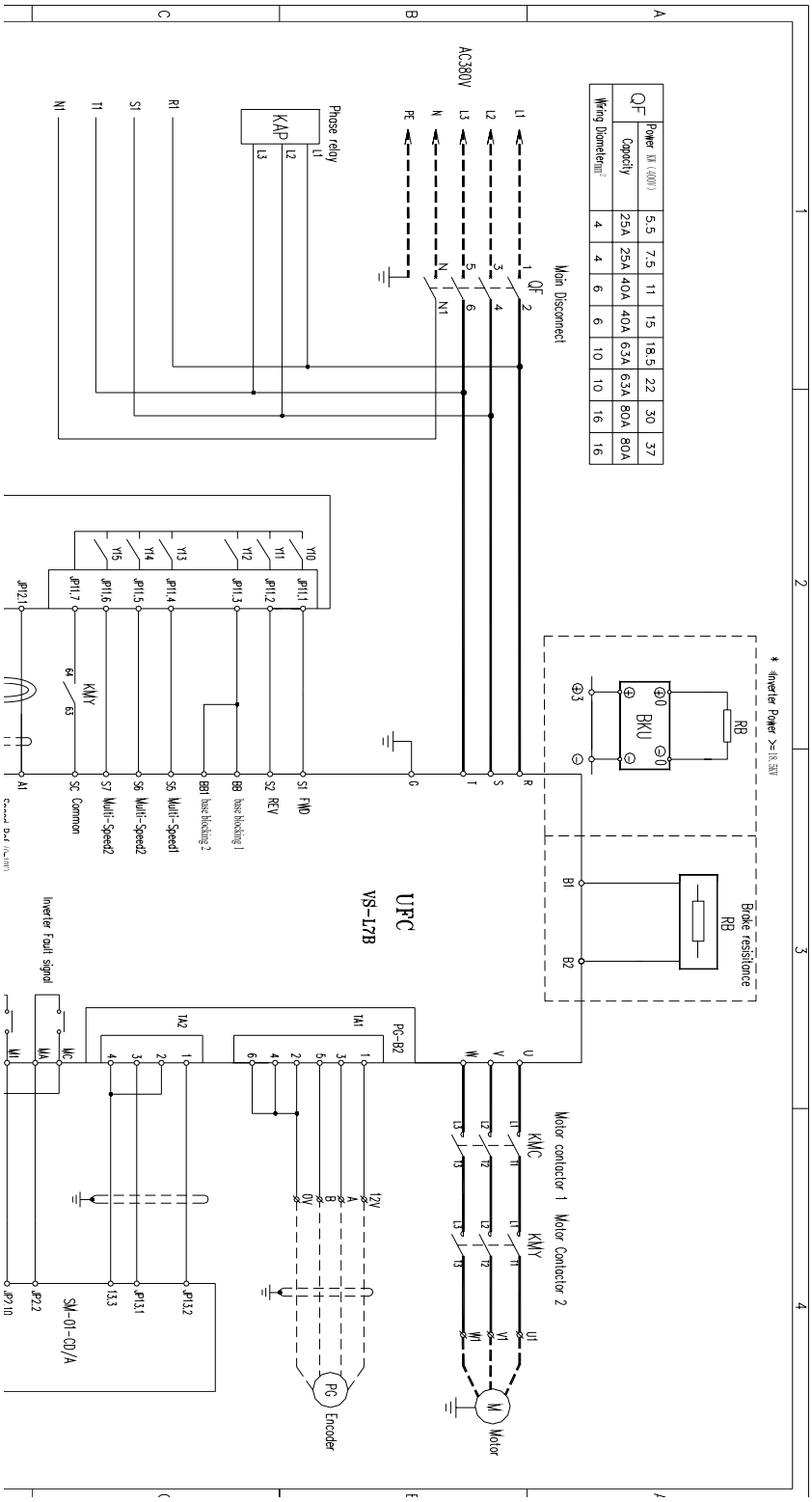
Description	Parameters	Remarks
Startup\Startup Config\Setup mode\Moto data		
Rated voltage	___V	rated voltage on motor label
Rated frequency	___Hz	rated frequency on motor label
Rated current	___A	rated current on motor label
Rated speed	___rpm	rated speed on motor label
Rated power	___Kw	rated capacity on motor label
Cosfi	0.85	refer to motor label
Efficiency	0.96	refer to motor label
Startup\Startup Config\Autotune (self-learning)		
Startup\Startup Config\Loadsetup (save data from self-learning)		
Startup\Startup Config\Mechanical data		
Startup\Startup Config\Encoders config		
Speed fbk sel	Std encoder	
Std enc type	Digital	SIN/CO encoders
Std enc pulses	1024ppr	
Std dig enc mode	FP mode	
Std enc supply	5.41/8.16V/	
Std sin enc Vp	0.5V	

1. Steps of self-learning

- ◆ Enter STARTUP/SETUP MODE/Autotune/Complete rot autotune;
- ◆ Have KMB,KMC,KMY closed when Press I key is on display, give Enable and Direction and press I Key on the inverter;
- ◆ With End on display, cancel Enable and Direction;
- ◆ Run Load setup.

II.4 iAstar Inverter(Asynchronous iAstar-S3A)

□ Wiring Diagram



□ A List of Parameters

Parameter	Expression	Description	Default	Remarks
A01	Fixed version	Version of software, press *Enter* with 99.99 to load default by ex-works, with 99.98 to delete error log.	445.01	4＝400V; 4＝hardware version; 5＝power
A02	Language	0－English; 1－Chinese	1	
A03	Motor phasing	A03=4 for phasing, when finished A03=3; A03=0 for manual setting	1	See Appendix 1
A04	Mode of operation	0: digital; 1: analogy	1	
C01	Ratio for zero speed	E13＝0, when C02>0, for use during C14.	100.00	130
C02	Integral for zero speed	Hold default loaded, may set the value after inspection travel.	0.00	80
C03	Ratio for low speed	Working frequency ≤F1, motor at driving.	110.00	60/140
C04	Integral for low speed	Working frequency ≤F1, motor at driving.	10.00	35/45
C05	Ratio for low speed	Working frequency ≤F1, motor at braking.	110.00	60/90/100
C06	Integral for low speed	Working frequency ≤F1, motor at braking.	10.00	35
C07	Ratio for intermediate speed	When F1<Working frequency ≤F2.	120.00	100
C08	Integral for intermediate speed	When F1<Working frequency ≤F2.	15.00	20/25
C09	Ratio for high speed	When Working frequency > F2.	100.00	160/180
C10	Integral for high speed	When Working frequency > F2.	10.00	5
C11	Switch in speed 1	Switch in low speed	0.50	
C12	Switch in speed 2	Switch in high speed	25.00	
C13	Current loop gain%	Normally no adjustment is necessary.	65.00	1for synchronization
C14	Zero servo time for time optimization.	The interval between *Enable* takes effect and the speed curve is given out.	0.800	
D01	Acceleration	Acceleration	0.650m/s^2	
D02	Deceleration	Deceleration	0.650m/s^2	
D03	Creeping speed	Creeping speed at low speed	0.012	
D04	S-curve (acc.1)	**A**cceleration initial jerk	0.650m/s^3	
D05	S-curve (acc.2)	Acceleration end jerk	0.650m/s^3	
D06	S-curve (dec.1)	Deceleration initial jerk	0.650m/s^3	
D07	S-curve (dec.2)	Deceleration end jerk	0.650m/s^3	
D08	Creeping time	Time required for creeping at low speed	0	
D09	Max. speed	The rated speed	*	by lift specification
D10	Mode of curve	0: normal;1: direct landing	0	
D11	Speed Ref.0	Multi-stage speed 0	0.000	
D12	Speed Ref.1	Multi-stage speed 1	0.145	
D13	Speed Ref.2	Multi-stage speed 2	0.030	
D14	Speed Ref.	Multi-stage speed 3	0.040	creeping

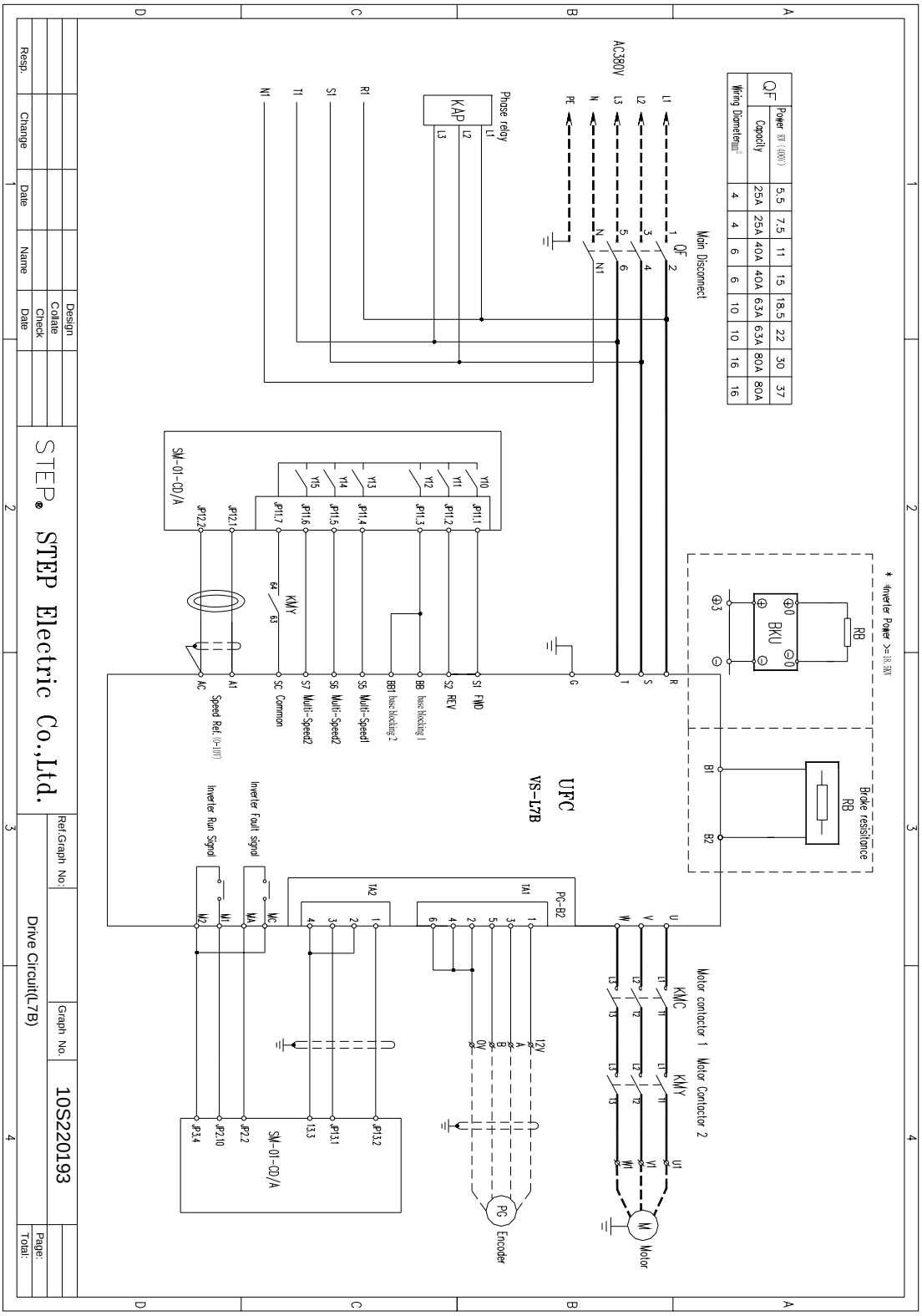
D15	Speed Ref.4	Multi-stage speed 4	0.290	inspection
D16	Speed Ref.5	Multi-stage speed 5	1.000	single-floor
D17	Speed Ref.6	Multi-stage speed 6	1.500	double-floor
D18	Speed Ref.7	Multi-stage speed 7	1.750	multi-floor
E01	Mode of control	0: asynchronous; 1: synchronous	0	
E02	Polarities of motor	Number of poles in motor	*	refer to motor label
E03	Rated voltage	Rated voltage of motor	*	refer to motor label
E04	Rated rotations	Rated rotations of motor	*	refer to motor label
E05	Rated current	Rated current of motor	*	refer to motor label
E06	Torque restriction	Restriction to max. torque out put	150	
E07	Frequency of difference in rotation	(SyncRot-RatedRot)/SyncRot*RatedFreq	1.40	
E08	Loading Frequency	Loading frequency of inverter output	8.0	
E09	Type of encoder	0 for increment, differentiating and SinCos, Must be 2048 for synchronization	0	
E10	Specification of encoder	Number of pulses per rotation	1024	by encoder
E11	Initial phase angle	Initial phase angle for synchronization	0	
E12	Frequency shunt output	Frequency shunt factor PG, corresponding to Exponent 0～7 of 2	0	
E13	Pre-loading	0: No load-weighing; 1: by Can Bus(stand-by); 2: by load-weighing analogy.	0	
H01	AI1 Function	AI1 multi-function analogy input	0	
H02	Analogy difference	AT1 Difference by analogy	10.000	
H03	Analogy gain	AT1 gain by analogy	1.00	
H04	Analogy filtering	Constant for filtering time by analogy	20	

□ A List of Error Codes

Er-Code	Description	Remarks
1	Breakdown in power module	
2	Breakdown in DSP Processor	
3	Over-heat in power module cooler	
4	Breakdown in braking unit and/or braking resistors	
5	Fuse broken off	
6	Over-torque	
7	Deviation in speed	
8	Over-voltage	
9	Under-voltage	
10	Missing phase by output	
11	Over-current	
12	Fault of encoder	
13	Current detected at standstill but the breakdown is not yet prevented.	
14	Reversed speed signal detected in travel	
15	Speed feedback detected without directory for operation	
16	Motor phasing reversed	
17	Over-speed protection in riding direction	
18	Over-speed protection in reversed direction	
19	R+/R- line-off protection	

II.5 iAstar Inverter(Synchronous iAstar-S3A)

□ Wiring Diagram



□ A List of Parameters

Parameter	Expression	Description	Default	Remarks
A01	Fixed version	Version of software, press *Enter* with 99.99 to load default by ex-works, with 99.98 to delete error log.	445.01	4＝400V; 4＝hardware version; 5＝power
A02	Language	0－English; 1－Chinese/	1	
A03	Motor phasing	A03=4 for phasing, when finished A03=3; A03=0 for manual setting	1	See Appendix 1
A04	Mode of operation	0: digital ;1: analogy	1	
C01	Ratio for zero speed	E13＝0, when C02>0, for use during C14.	100.00	130
C02	Integral for zero speed	Hold default loaded, may set the value after inspection travel.	0.00	80
C03	Ratio for low speed	Working frequency ≤F1, motor at driving.	110.00	60/140
C04	Integral for low speed	Working frequency ≤F1, motor at driving.	10.00	35/45
C05	Ratio for low speed	Working frequency ≤F1, motor at braking.	110.00	60/90/100
C06	Integral for low speed	Working frequency ≤F1, motor at braking.	10.00	35
C07	Ratio for intermediate speed	When F1<Working frequency ≤F2.	120.00	100
C08	Integral for intermediate speed	When F1<Working frequency ≤F2.	15.00	20/25
C09	Ratio for high speed	When Working frequency > F2.	100.00	160/180
C10	Integral for high speed	When Working frequency > F2.	10.00	5
C11	Switch in speed 1	F1: Switch in low speed	0.50	
C12	Switch in speed 2	F2: Switch in high speed	25.00	
C13	Current loop gain%	Normally no adjustment is necessary.	65.00	1for synchronization
C14	Zero servo time for time optimization.	The interval between *Enable* takes effect and the speed curve is given out.	0.800	
D01	Acceleration	Acceleration	0.650 m/s^2	
D02	Deceleration	Deceleration	0.650 m/s^2	
D03	Creeping speed	Creeping speed at low speed	0.012	
D04	S-curve (acc.1)	**A**cceleration initial jerk	0.650 m/s^3	
D05	S-curve (acc.2)	Acceleration end jerk	0.650 m/s^3	
D06	S-curve (dec.1)	Deceleration initial jerk	0.650 m/s^3	
D07	S-curve (dec.2)	Deceleration end jerk	0.650 m/s^3	
D08	Creeping time	Time required for creeping at low speed	0	
D09	Max. speed	The rated speed	*	by lift specification
D10	Mode of curve	0: normal;1: direct landing	0	
D11	Speed Ref.0	Multi-stage speed 0	0.000	
D12	Speed Ref.1	Multi-stage speed 1	0.145	
D13	Speed Ref.2	Multi-stage speed 2	0.030	
D14	Speed Ref.3	Multi-stage speed 3	0.040	creeping

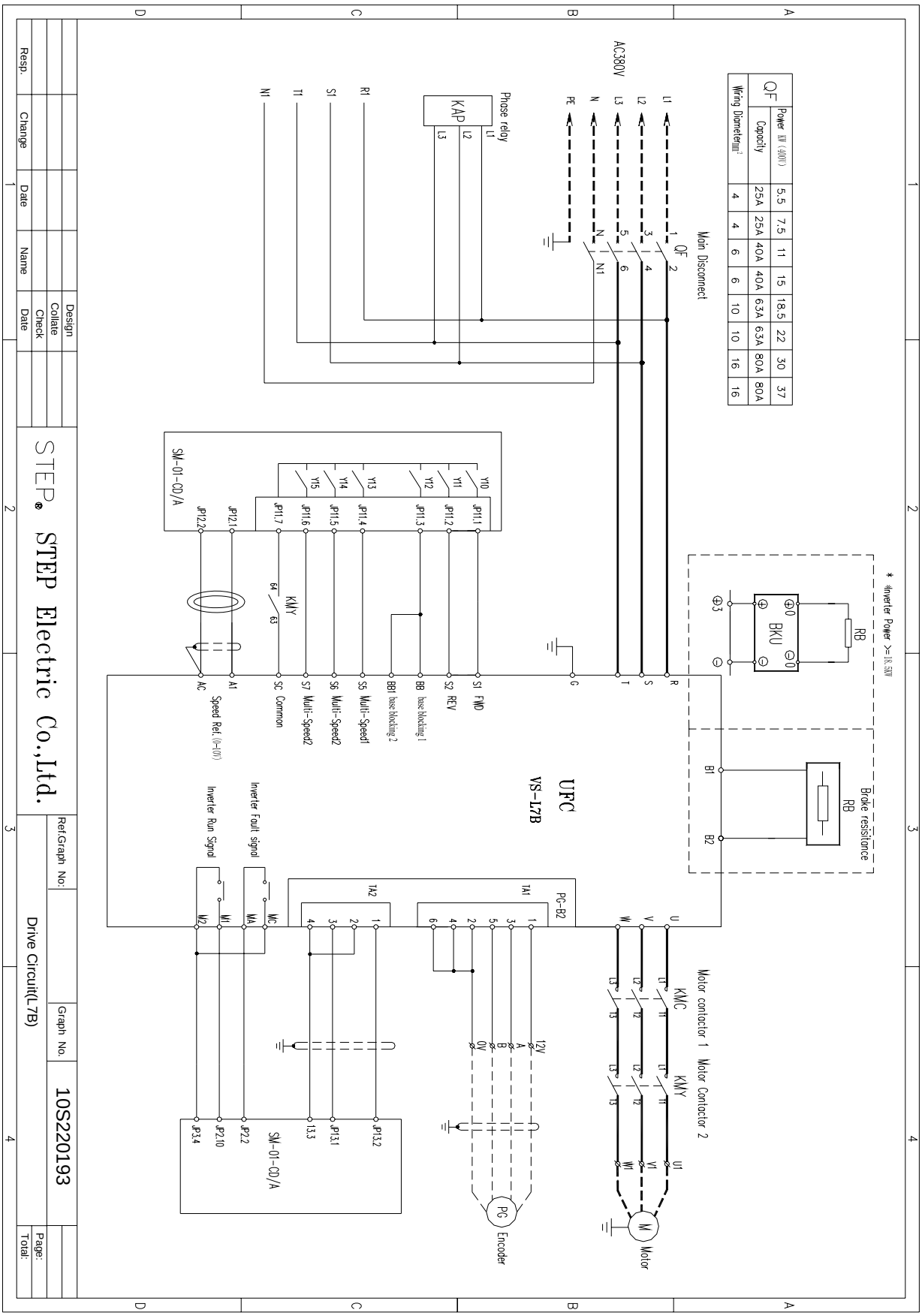
D15	Speed Ref.4	Multi-stage speed 4	0.290	inspection
D16	Speed Ref.5	Multi-stage speed 5	1.000	single-floor
D17	Speed Ref.6	Multi-stage speed 6	1.500	double-floor
D18	Speed Ref.7	Multi-stage speed7	1.750	multi-floor
E01	Mode of control	0: asynchronous; 1: synchronous	0	
E02	Polarities of motor	Number of poles in motor	*	refer to motor label
E03	Rated voltage	Rated voltage of motor	*	refer to motor label
E04	Rated rotations	Rated rotations of motor	*	refer to motor label
E05	Rated current	Rated current of motor	*	refer to motor label
E06	Torque restriction	Restriction to max. torque out put	150	
E07	Frequency of dif- ference in rotation	(SyncRot-RatedRot)/SyncRot*RatedFreq	1.40	
E08	Carry Frequency	Carry frequency of inverter output	8.0	
E09	Type of encoder	0 for increment, differentiating and SinCos, Must be 2048 for synchronization	0	
E10	Specification of encoder	Number of pulses per rotation	1024	by encoder
E11	Initial phase angle	Initial phase angle for synchronization	0	
E12	Frequency shunt output	Frequency shunt factor PG, corresponding to Exponent 0～7 of 2	0	
E13	Pre-loading	0: No load-weighing; 1: by Can Bus(stand-by); 2: by load-weighing analogy.	0	
H01	AI1 Function	AI1 multi-function analogy input 0;	0	
H02	Analogy difference	AT1 Difference by analogy	10.000	
H03	Analogy gain	AT1 gain by analogy	1.00	
H04	Analogy filtering	Constant for filtering time by analogy	20	

□ A List of Error Codes

Er-Code	Description	
1	Breakdown in power module	
2	Breakdown in DSP Processor	
3	Over-heat in power module cooler	
4	Breakdown in braking unit and/or braking resistors	
5	Fuse broken off	
6	Over-torque	
7	Deviation in speed	
8	Over-voltage	
9	Under-voltage	
10	Missing phase by output	
11	Over-current	
12	Fault of encoder	
13	Current detected at standstill but the breakdown is not yet prevented.	
14	Reversed speed signal detected in travel	
15	Speed feedback detected without directory for operation	
16	Motor phasing reversed	
17	Over-speed protection in riding direction	
18	Over-speed protection in reversed direction	
19	R+/R- line-off protection	

II.6 Yaskawa Inverter L7B

□ Wiring Diagram



□ A List of Parameters (L7B)

Function Code	Description	Parameter value		Remarks
		analogy	digital	
A1-00	Language in display	0*	0*	
A1-01	User priority for parameters	2	2	
A1-02	Mode of control	3*	3*	2 for open loop
B1-01	Speed reference	1*	0*	
B1-02	Operational directory	1	1	
B1-03	Way of stop	1*	1*	
C1-01	Acceleration time 1	0*	2.5**	
C1-02	Deceleration time 1	0*	2.5**	
C1-09	Time for emergency stop	1*	1*	
C2-01	Acceleration initial jerk	0*	1.2*	
C2-02	Acceleration end jerk	0*	0.8*	
C2-03	Deceleration initial jerk	0*	0.8*	
C2-04	Deceleration end jerk	0*	1.0*	
C5-01	ASR ratio increment 1	15**	15**	
C5-02	ASR integral time 1	0.5**	0.5**	
C5-03	ASR ratio increment 2	40**	40**	
C5-04	ASR integral time 1	0.5**	0.5**	
C5-07	ASR switching frequency	10**	10**	
D1-02	Frequency directory 2	0	0	
D1-03	Frequency directory 3	0	0	
D1-04	Frequency directory 4	0	1.5**	creeping speed
D1-05	Frequency directory 5	0	10.0**	inspection speed
D1-06	Frequency directory 6	0	30**	single-floor speed
D1-07	Frequency directory 7	0	40**	double-floor speed
D1-08	Frequency directory 8	0	50**	multi-floor speed
E1-01	Voltage of power supply input	400**	400**	
E1-02	Motor	0*	0*	
E1-04	Min frequency of output	50**	50**	
E1-05	Max voltage	380**	380**	
E1-06	Base frequency	50**	50**	
E1-09	Min frequency of output	0*	0*	
E2-01	Rated current of motor			refer to motor label
E2-02	Rated difference in rotation of motor			refer to motor label
E2-03	Motor current on empty load			35-40% of the rated current
E2-04	Polarities			refer to motor label
E2-05	Resistance between motor wirings			
E2-06	Electric leakage of motor			
E2-07	Core satiation factor 1 of motor			
E2-08	Core satiation factor 2 of motor			

E2-09	Mechanical loss of motor			
E2-11	Rated capacity of motor			
F1-01	PG constant	600*	600*	refer to the encoder
F1-02	Act when PG break-off is detected	0*	0*	
F1-03	Act when over-speed is detected	0*	0*	
F1-04	Act when excessive deviation is detected	0*	0*	
F1-05	PG direction of rotation	0	0	
F1-06	PG ratio of frequency shunt	1	1	
F1-08	Criteria to detect over–speed	105	105	
F1-09	Time to detect over-speed	1*	1*	
F1-10	Criteria to detect excessive speed deviation	30	30	
F1-11	Time to detect excessive speed deviation	1	1	
H1-03	Function of Terminal S5	F*	3	
H1-04	Function of Terminal S6	F*	4	
H1-05	Function of Terminal S7	F*	5*	
H1-06	Function of Terminal S8	9*	9*	to be set at 9 for base blocking
H3-01	Signal priority on Terminal A1	0	0	
H3-02	Input gain on Terminal A1	100**	100**	
H3-03	Input deviation on Terminal A1	0**	0	
H3-04	Signal priority on Terminal A3	0	0	
H3-08	Signal priority on Terminal A2	2	2	
H3-09	Function of Terminal 2	1F*	1F*	
H3-12	Time for analogical input filtering	0.03**	0*	
H3-15	Signal priority on Terminal A1	0	0	
H3-16	Input gain on Terminal A1	100	100	
H3-16	Input deviation on Terminal A1	0	0	
L3-04	Function against speed loss in deceleration	0*	0*	
E1-04	Max. output frequency	0	0	
T1-01	Mode of self-learning	0	0	
T1-02	Output capacity of motor			refer to motor label
T1-03	Rated voltage of motor			refer to motor label
T1-04	Rated current of motor			refer to motor label
T1-05	Base frequency of motor			refer to motor label
T1-06	Polarities of motor			refer to motor label
T1-07	Rated rotations of motor			refer to motor label
T1-08	Number of PG pulses for self-learning	600**	600**	

Notice to customers

Dear customers:

RoHS is the English abbreviation of the *Restriction of the use of certain hazardous substances in electrical and electronic equipment*. EU implemented the RoHS on July 1, 2006, it regulates the limited use of six kinds of harmful materials during the electrical and electronic equipment products of recently putting on the market, such as lead, mercury, cadmium, sexavalence chromium, PBB, and PBDE etc..

On Feb 28, 2006, the seven ministries and commissions of Ministry of Information Industry of China, Development and Reform Commission, Department of Commerce, General Administration of Customs, State Administration for Industry and Commerce, State General Administration for Quality Supervision and Inspection and Quarantine, State Environmental Protection Administration jointly issued the *Measures for Administration of the Pollution Control of Electronic Information Products* which is the RoHS of Chinese version and make a compulsory implementation. On Feb 1, 2008, *Measures for Administration of the Environmental Protection of Electronic Wastes Pollution* which was issued by China Environmental Protection Administration began to be implemented which clearly regulated that the user of the electrical and electronic equipment product should offer or relegate the electronic waste to units (including individual business households) who had the corresponding scope of business listed in directory (including temporary directory) to demolish, utilize or dispose them.

The products of our company comply with the requirements of *Measures for Administration of the Pollution Control of Electronic Information Products* and RoHS on the part of electronic parts and components, PCB board, harness material, selecting and purchasing of structural element etc., it strictly controls the six kinds of harmful materials of lead, mercury, cadmium, sexavalence chromium, PBB, and PBDE. Also, during the production, PCB parts and components are welded in lead free product line using the lead free welding process.

The possible poisonous elements contained in the following components:

Components type	Electronic component	Electronic printed circuit board（PCB）	Sheet metal parts	Radiator	Working of plastics	Wire
Possible poisonous elements	Six kinds of harmful materials of lead, mercury, cadmium, sexavalence chromium, PBB, and PBDE					

1 Environmental impact analysis

During the usage, our company products will produce some heat to result in some harmful materials volatilizing very a little, however, it can not seriously affect the environment. While the electronic products are out of use at the end of the lifecycle and are discarded, the heavy metal and chemical poisonous material will seriously pollute the soil and water source.

2 Lifecycle of electronic products and equipments

Any electronic products and equipments have its service life and can be abandoned, even though it can be used, it also will be washed out by upgraded products. The lifecycle of our company electronic products and equipments are generally below 20 years.

3 Abandoned disposal methods of electronic products

When the various electronic products are abandoned, if disposed improperly, they will pollute the environment. Our company requires the customer to establish the recycle system according to the national corresponding provisions, it can not be disposed as general domestic garbage or general industrial solid waste, and it shall be stored and utilized by environmental harmless method or unified recovered and disposed by authorized units

strictly according to *Measures for Administration of the Environmental Protection of Electronic Wastes Pollution* issued by China Environmental Protection Administration. For any individual and unit without rights, to demolish, utilize or dispose electronic wastes is forbidden.

Please don't discard the electronic wastes with common domestic garbage. Any proposal about disposal of electronic wastes, please contact local waste product disposal organization or environmental protection bureau.

Shanghai STEP Electric Corporation