NS05 Series

Villa Lift Control Cabinet

User Manual

Ver Number: V1.19

Content

FOREWORD

Thank you for using NS05 series villa lift control cabinet. NS05 series villa lift control cabinet is new generation control cabinet for villa lift. It combines elevator intellectual logic control and high-performance VVVF drive control. With user friendly interface and advanced technology integrated together, the system not only has outstanding performance, but also shows strong reliability in practice.

The system combines intellectual logic control and high-performance VVVF drive control.

Adopts advanced vector control technology, demodulates motor with high precision, takes full advantage of motor capacity, improves elevator performance and comfort feel.

Adopts advanced space vector PWM calculation method, compare with traditional sine/cosine PWM method, it improves elevator operation efficiency and saves more energy.

Adopts full function of BL2000/3000 system, maximize the performance of elevator in different application.

When using the Synchronous machine, controller could pre-define the machine type with the most optimized model, save machine parameter input and auto-tuning process, improves the commissioning efficiency and maximize the machine performance.

Fuzzy logic control with non-load-compensation start-up. Excellent comfort feels without lift weighing device.

Rotating or static auto-tuning to get motor parameters and initial angle.

Suitable for both gearless PM Synchronous traction machine and asynchronous induction machine.

Brake units are built in for the whole NS05 series to reduce external component cost.

Internal encoder and frequency dividing interface to match different PG signal.

Advanced double 32-bit CPU and FPGA for complete elevator control, with high reliability on elevator safety.

Redundancy design and full software-hardware protection to achieve elevator safety and reliability.

Passed professional EMC test, suitable for complicated job site.

Monitor the cutting current from controller to main motor every time elevator stops.

Generate optimized speed curve based on target floor to enable lift stop directly with high efficiency.

CAN BUS serial communication technology with high speed and reliability. Simplify system wiring/extension.

Adopts wireless/LAN remote control interface, convenient for long distance commissioning, maintenance and elevator monitoring.

Equips upper monitoring and software, convenient for parameter setting, commissioning and debugging.

Data recorder to save integrated controller operation data, help for onsite maintenance /trouble shooting.

Parameter upload, download and copy to help onsite maintenance.

Support ARD function with only UPS unit.

Match GB 7588-2003 (equivalent to EN-81) safety standard.

This user guide has introduced on how to use NS05 series villa lift control cabinet. Please read it carefully and understand safety items before use (installation, running maintenance). This user guide is for elevator designer, installation and maintenance technician. The installation, commissioning and maintenance must be performed by train technician.

Chapter 1 SAFETY INFORMATION

1.1. LABEL DESCRIPTION

The following conventions are used to indicate precautions in this user guide. Failure to notice the precautions provided in this user guide can result in serious or even fatal injury to damage to the products or to related equipment and systems.

Indicates precautions that if not heeded could possibly result in loss of life or serious injury.

Indicates precautions that if not heeded could result in relatively serious or minor injury to the operator and damage to the product. Also, it should be noted that even for 

precautions, in certain situations could result in serious accident.

Indicate important information that should be memorized.

1.2. SAFETY PRECAUTIONS

Confirmation upon Delivery

Never install an integrated controller that is damaged or missing components.
Otherwise it will cause injury.

Installation

Always hold the case when carrying the integrated controller
Otherwise the integrated controller may drop and damage.

Please install the device to a metal surface or other non-flammable objects
Otherwise there is a fire-hazard potential.

Please mount the device to an object that is strong enough.
Otherwise the integrated controller may drop and damage.

Please install the device in a dry place where water or rain could not get into.
Otherwise the integrated controller could get damaged.

For the same cabinet to install the integrated controller and brake resistor, install cooling fan or other cooling device and make sure the air temperature entering is below 45°C
Overheat can result in fires or other accidents.

Do not install the device in the environment containing flammable, explosive gas or nearby.
Otherwise there is risk of fire or explosion.

Do not leave any metallic objects inside the integrated controller
Otherwise it may damage the device and has fire-hazard potential.

Wiring

WARNING

Always turn OFF the input power supply before wiring terminals.
Otherwise, an electric shock or fire can occur.

Wiring must be performed by an authorized person qualified in electrical work.
Otherwise, an electric shock or fire can occur.

Be sure to ground the ground terminal. (200 V Class: Ground to 100 Ω or less, 400 V Class: Ground to 10 Ω or less)
Otherwise, an electric shock or fire can occur.

Always check the operation of any Emergency stop circuits after they are wired.
Otherwise, there is the possibility of injury. (Wiring is the responsibility of the user.)

Never touch the output terminals directly with your hands or allow the output lines to come into contact with the Inverter case. Never short the output circuits.
Otherwise, an electric shock or ground short can occur.

CAUTION

Check to be sure that the voltage of the main AC power supply satisfies the rated voltage of the Inverter.
Injury or fire can occur if the voltage is not correct.

Do not perform voltage withstand tests on the Inverter.
Otherwise, semiconductor elements and other devices can be damaged.

Connect braking resistors.
Otherwise, a fire can occur and the Inverter.

Tighten all terminal screws to the specified tightening torque.
Otherwise, a fire may occur.

Do not connect AC power to output terminals U, V, and W.
The interior parts of the Inverter will be damaged if voltage is applied to the output terminals.

Do not connect phase-advancing capacitors or LC/RC noise filters to the output circuits.
The Inverter can be damaged or interior parts burnt if these devices are connected.

Do not make terminal DC+ and DC- short link.
Otherwise, a fire or explosion may occur.

Trial Operation

WARNING

Check to be sure that the front cover is attached before turning ON the power supply.
Otherwise, an electric shock may occur.

Do not get close to machine and related objects when choosing the error auto reset function, as the drive will automatically restart after warning reset.
Otherwise, an injury may occur.

Reset alarms only after confirming that the RUN signal is OFF.
Otherwise, an Injury may occur.

Do not perform fault operation and signal checking while the drive is running.
Otherwise an injury may occur, and the drive may get damaged.

CAUTION

Do not touch the radiation fins (heat sink), braking resistor, or Braking Resistor Unit. These can become very hot.

Otherwise, a burn injury may occur.

Do not touch the braking resistor.

Doing so can result in electric shock.

Be careful when changing Inverter settings. The Inverter is factory set to suitable settings.

Otherwise, the equipment may be damaged.

Maintenance and Inspection

WARNING

Do not touch the Inverter terminals. Some of the terminals carry high voltages and are extremely dangerous.

Doing so can result in electric shock.

Always have the protective cover in place when power is being supplied to the Inverter.

When attaching the cover, always turn OFF power to the Inverter through the MCCB.

Doing so can result in electric shock.

After turning OFF the main circuit power supply, wait for the time indicated on the front cover, and make sure the CHARGE indicator light has gone out, and then perform maintenance and inspection.

The capacitor will remain charged and is dangerous.

Maintenance, inspection, and replacement of parts must be performed only by authorized personnel. Remove all metal objects, such as watches and rings, before starting work. Always use grounded tools.

Failure to heed these warning can result in electric shock.

Do not change the wiring, or remove connectors or terminal, during power on period.

Otherwise, an electric shock may occur.

CAUTION

A CMOS IC is used in the control board. Handle the control board and CMOS IC carefully.

The CMOS IC can be destroyed by static electricity if touched directly.

Other

WARNING

Do not attempt to modify or alter the Inverter.

Doing so can result in electrical shock or injury.

Chapter 2 Introduction and Installation

This chapter introduces models, specifications, product appearance, size, and product function of the NS05 series villa lift control cabinet, and describes the checks required upon receiving or installing an Inverter.

2.1. System Composition and Model Description

2.1.1 System composition

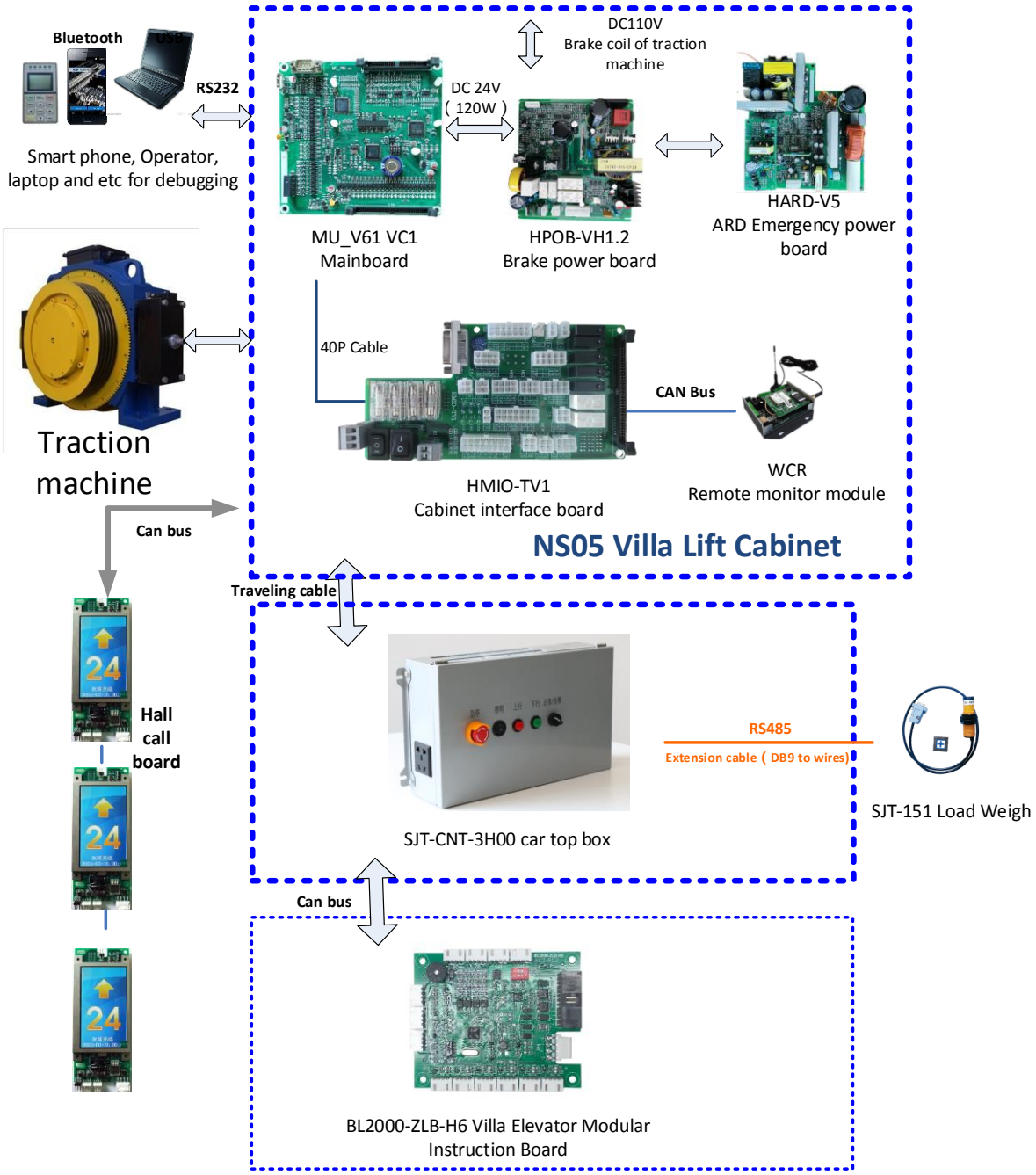


FIGURE 2.1 SYSTEM COMPOSITION OF INTEGRATED CONTROL CABINET

2.1.2 Model description

The model of NS05 series villa lift control cabinet on the nameplate indicates the specification, voltage level, and maximum motor capacity of the controller in alphanumeric codes. Refer to Figure 2.2 for example (5.5kw, 400V rank).

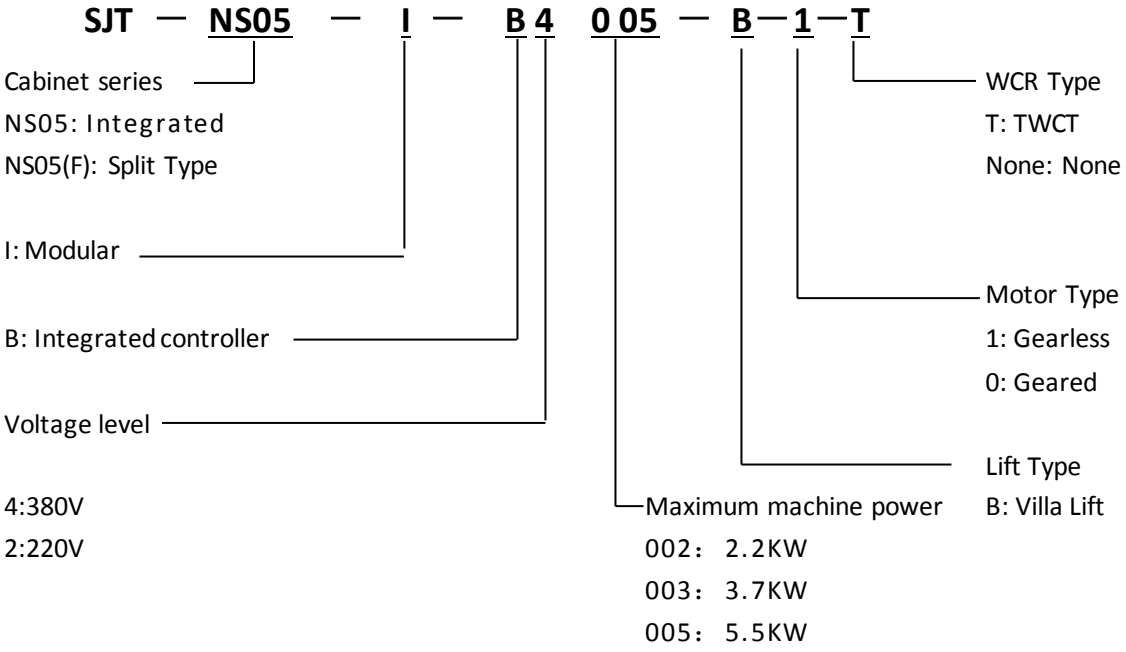


FIGURE 2.2 MODEL DESCRIPTION DIAGRAM

2.2. Nameplate Information

Nameplate information is shown in Figure 2.3 below.

Nameplate attached to the right side of NS05 series villa lift control cabinet describes the model, power, input, output, serial number, and other information about the controller.

Example: A standard nameplate for NS05 series villa lift control cabinet: 3-phase, 400 VAC, 2.2KW.

ELEVATOR CONTROL SYSTEM

Rated Load	**450 kg**	**Rated Speed**	**0.5 m/s**
Rated Voltage	**AC220V**	**Rated Power**	**2.2kW**
TYPE	**SJT-NS05-I**	**Rated Current**	**11A**
Layer/ Station	**10/10**	**Control Mode**	**Complete selection**
Certificate Institution	**Elevator Testing Center of Shanghai Jiaotong University**	**Speed Control Mode**	**AC variable frequency speed regulation**
Serial No.	**EN81-047**	**Date**	**2022-12-01**

FIGURE 2.3 NAME PLATE INFORMATION

2.3. Specifications

Specifications of NS05 series villa lift control cabinet in chart 2.1.

Chart 2.1 Specifications

MODEL: SJT-NS05-I-B40□□-B-1/0-□		4002	4003	4005
MAX MOTOR POWER(KW)		2.2	3.7	5.5
RATED OUTPUT	RATED OUTPUT CAPACITY(KVA)	4	5.9	9
	RATED OUTPUT CURRENT(A)	5.5	9	14
	MAX OUTPUT VOLTAGE(V)	3-PHASE, AC380 (CORRESPONDING TO THE INPUT VOLTAGE)		
	RATED FREQUENCY(Hz)	50		
	MAX OUTPUT FREQUENCY(Hz)	120		
INPUT POWER	RATED VOLTAGE (V)	3-PHASE, AC380		
	RATED FREQUENCY (Hz)	50		
	RATED INPUT CURRENT (A)	10	11	17
	ALLOWABLE VOLTAGE FLUCTUATION	±15%		
	ALLOWABLE FREQ FLUCTUATION	±5%		
MODEL: SJT-NS05-I-B20□□-B-1/0-□		2002	2003	
MAX MOTOR POWER(KW)		2.2	3.7	
RATED OUTPUT	RATED OUTPUT CAPACITY(KVA)	4	7	
	RATED OUTPUT CURRENT(A)	11	16	
	MAX OUTPUT VOLTAGE(V)	3-PHASE, AC220 (CORRESPONDING TO THE INPUT VOLTAGE)		
	RATED FREQUENCY(Hz)	50		
	MAX OUTPUT FREQUENCY(Hz)	120		
INPUT POWER	RATED VOLTAGE (V)	SINGLE-PHASE/3-PHASE, AC220		
	RATED FREQUENCY (Hz)	50		
	RATED INPUT CURRENT(A)(3-PH)	12.5	21	
	RATED INPUT CURRENT(A)(1-PH)	26	37	
	ALLOWABLE VOLTAGE FLUCTUATION	+20%，-15%		
	ALLOWABLE FREQ FLUCTUATION	±5%		
BASIC FEATURES	ELEVATOR CONTROL MODE	SIMPLEX COLLECTIVE		
	ELEVATOR SPEED RANGE	<=1m/s		
	APPLICABLE HIGHEST FLOOR	10		
	APPLICABLE ELEVATOR TYPE	VILLA ELEVATOR		
	APPLICABLE MOTOR	GEAR TRACTION MACHINE, GEARLESS TRACTION MACHINE		
	COMMUNICATION MODE	CAN BUS SERIAL COMMUNICATION		
	LEVELING ACCURACY	≤3MM		

CHART2.1 SPECIFICATIONS (CONT'D)

DRIVE FEATURES	CONTROL MODE	SPACE VECTOR PWM(SVPWM) CLOSED LOOP VECTOR CONTROL
	CARRIER FREQUENCY	8KHZ (6~15KHZ ADJUSTABLE)
	SPEED CONTROL RANGE	1:1000
	SPEED CONTROL ACCURACY	±0.05%(25℃±10℃)
	SPEED RESPONSE	30HZ
	TORQUE LIMIT	YES (SET BY PARAMETER)
	TORQUE ACCURACY	±5%
	FREQUENCY CONTROL RANGE	0~120HZ
	FREQUENCY ACCURACY	DIGITAL REF: ±0.01% (-10℃ ~+40℃)
	FREQUENCY REF RESOLUTION	DIGITAL REF: 0.01HZ
	OUTPUT FREQ RESOLUTION	0.01HZ
	OVERLOAD CAPACITY	150% RATED CURRENT 60S; 200% RATED CURRENT 10S
	STARTUP TORQUE	200% RATED CURRENT 0HZ
	ACCEL/DECEL TIME	0.001~600S
	MAIN CONTROL FUNCTION	START WITHOUT LOAD COMPENSATION, BATTERY OPERATION, AUTO TUNING, LOAD COMPENSATION, COOLING FAN CONTROL, BASE BLOCK, TORQUE LIMIT, CAN COMMUNICATION REF, ACCELERATION/ DECELERATION TIME, S CURVE ACCELERATION/ DECELERATION, MONITOR OF MAIN MACHINE FOR WHICH ELECTRIC CURRENT CAN BE EFFECTIVELY INTERDICT OR NOT WHEN THE CAR STOP, INTERNAL BRAKE, PGFREQ DIVIDING OUTPUT, AUTOMATIC FAULT RETRY, AUTOMATIC FAULT RESET, PARAMETER COPY
CONTROL INPUT/OUTPUT	OC INPUT CONTROL POWER	ISOLATED EXTERNAL DC24V
	RELAY OUTPUT POWER	ISOLATED INTERNAL DC24V
	LOW OPTO-ISOLATED INPUTS	26-CHANEL SWITCHES: RATED LOAD: 7MA/DC24V, UPPER FREQ100HZ
	PROGRAMMABLE RELAY OUTPUT	13-CHANEL SWITCHES: 9 CHANNELS: 1NO, CONTACTOR CAPACITY: 5A/30VDC, 5A/250VAC
	CAN COMMUNICATION INTERFACE	2CHANELS: DUPLEX/ GROUP CONTROL, HOP/COP, REMOTE WIRELESS MONITORING
	RS-232COMMUNICATION INTERFACE	1CHANEL: DIGITAL OPERATOR/ PC MONITORING/ PROGRAMMABLE INTERFACE
DISPLAY	DIGITAL OPERATOR	LCD DISPLAY IN CHINESE/ENGLISH
	MONITORING SOFTWARE INTERFACE	DISPLAY PARAMETERS, ELEVATOR RUNNING STATUS, DIGITAL WAVE
MAIN PROTECTION FUNCTION	OVER CURRENT	STOP WHEN CURRENT EXCEED 200% RATED OUTPUT CURRENT
	FUSE	STOP AT FUSE BRAKE AT MAIN CIRCUIT
	OVERLOAD PROTECTION	STOP AT 150% RATED CURRENT 60S/180% RATED CURRENT 10S
	OVERVOLTAGE PROTECTION	STOPS AT DC BUS VOLTAGE OVER 750V (400V DRIVE) OR 410V (200V DRIVE)
	UNDERVOLTAGE PROTECTION	STOPS AT DC BUS VOLTAGE UNDER 380V (400V DRIVE) OR 190V (200V DRIVE)
	HEATSINK OVERHEAT PROTECTION	PROTECT BY THERMISTORS
	IGBT INTERNAL PROTECTION	IGBT OVER CURRENT/ OVERHEAT/ SHORT CIRCUIT/UNDER VOLTAGE PROTECTION
	MOTOR PROTECTION	OVERLOAD PROTECTION STOP
	IMPACT RESTRAINING CIRCUIT	PROTECT BY CONTACTOR FEEDBACK

CHART2.1 SPECIFICATIONS (CONT'D)

MAIN PROTECTION FUNCTION	OVER SPEED PROTECTION	PROTECT AT SPEED EXCEED THE MAXIMUM ALLOWABLE SETTING
	SPEED DEVIATION PROTECTION	PROTECT AT SPEED DEVIATION EXCEEDS ALLOWABLE VALUE
	PG FAULT PROTECTION	PROTECT AT PG DISCONNECTION/ PHASE ERROR
	AUTO-TUNING PROTECTION	PROTECT AT AUTO-TUNING FAULT.
	OPEN-PHASE PROTECTION	PROTECT AT INPUT/OUTPUT PHASE LOST
	DOOR INTERLOCK FAULT	PROTECT AT DOOR INTERLOCK CIRCUIT OPEN WHEN RUNNING
	SAFETY CIRCUIT FAULT	PROTECT AT SAFETY CIRCUIT OPEN WHEN RUNNING
	BRAKE CIRCUIT FAULT	NO BRAKE OPEN FEEDBACK SIGNAL AFTER OUTPUT BRAKE OPEN COMMAND
	LEVELING ZONE FAULT	PROTECT AT LEVELING ZONE SIGNAL FAULT
	OUTPUT CONTACTOR FAULT	PROTECT AT OUTPUT CONTACTOR FAULT
	RUNNING TIME PROTECTION	PROTECT AT SIGNAL RUNNING TIME EXCEEDS LIMIT
	FLOOR COUNTING FAULT	PROTECT AT FLOOR COUNTER FAULT
	COMMUNICATION INTERFERENCE FAULT	PROTECT AT COMMUNICATION INTERFERENCE FAULT
	HOISTWAY PARAMETER LEARNING FAULT	HOISTWAY PARAMETER LEARNING FAULT PROTECTION
STRUCTURE	PROTECTION DEGREE	C: CLOSED IP20; O: OPEN IP00
	COOLING	FORCED AIR COOLING
	INSTALLATION	FLOOR MOUNTED, RECESSED OR HANGING INSTALLATION
USING AMBIENCE	AMBIENT TEMPERATURE	-10℃~+40℃
	HUMIDITY	5~95%RH, NON-CONDENSING
	STORAGE TEMPERATURE	-20℃ ~+60℃
	APPLICATION SITUATION	IN DOORS, WITHOUT DIRECT SUNLIGHT, DUST, CORROSIVE/EXPLOSIVE GASES, OIL FOG, VAPOR, WATER DRIPPING, OR SALTY SUBSTANCES
	ALTITUDE	<1000M
	VIBRATION	10~20HZ, <9.8M/S²;20~50HZ, <2M/S²

2.4. Appearance and External Dimension

The product can be separated to main control cabinet and ARD cabinet two parts, and can be multiple installed or separately installed.

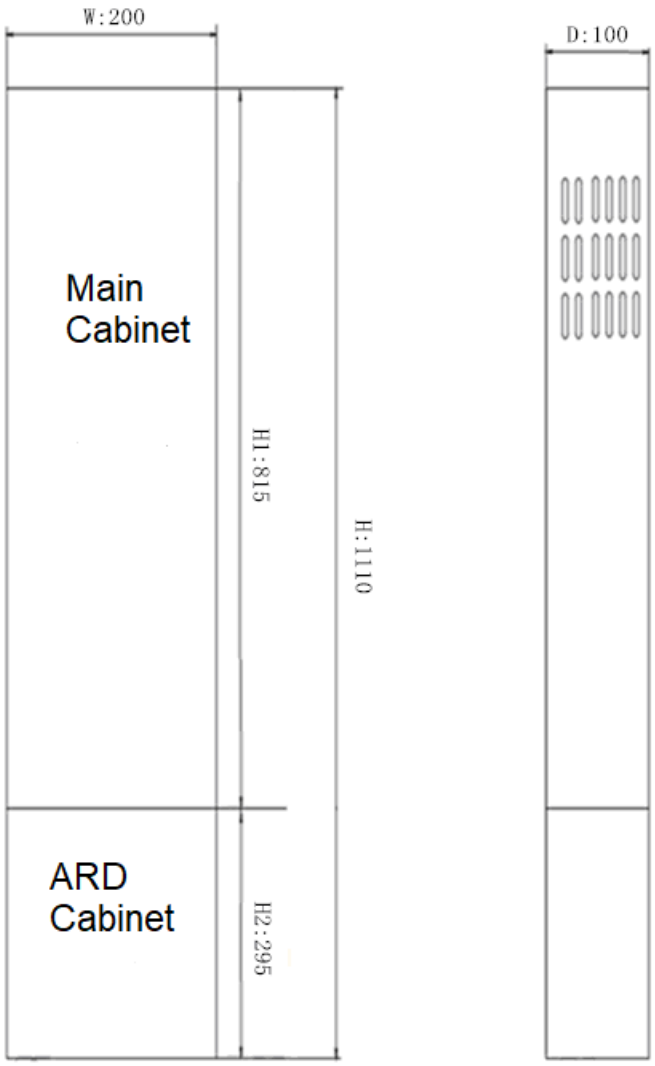


FIGURE 2.4 APPEARANCE AND EXTERNAL DIMENSION OF INTEGRATED CABINET（UNIT:MM）

Chart 2.2 Cabinet dimension

Cabinet	Exterior Dimension			
	W	D	H1	H2
SJT-NS05-I-B2（4）0□□-B-1/0-□	200	100	815	295

2.5. Cabinet Layout diagram

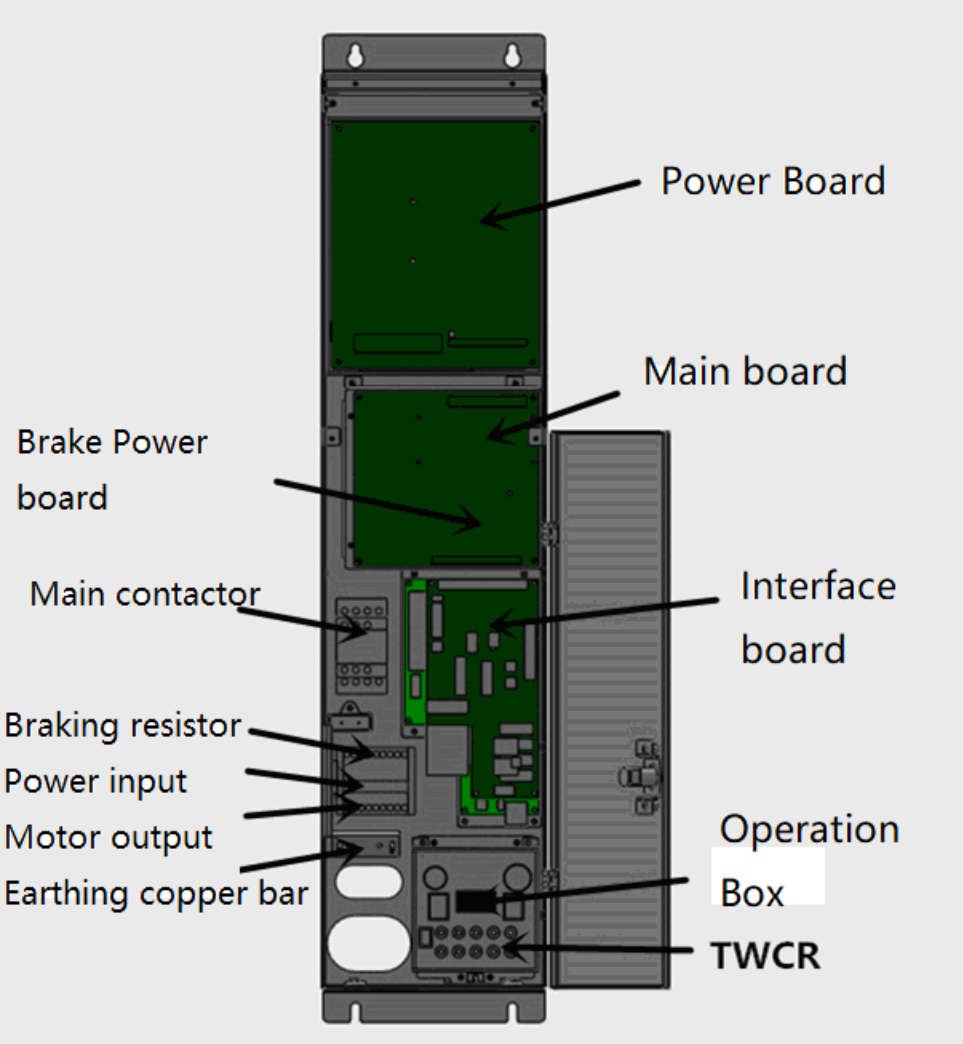


FIGURE 2.5 LAYOUT DIAGRAM OF MAIN CABINET

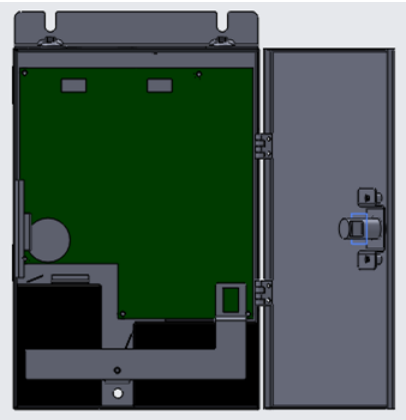


FIGURE 2.6 LAYOUT DIAGRAM OF ARD CABINET

2.6. Introduction of control cabinet parts

2.6.1 Integrated controller of NS05 series villa lift

NS05 series villa lift controller is split type design. Pin definition is in chart 2.3

CHART 2.3 INPUT AND OUTPUT DEFINITION ON MAINBOARD

TYPE	NAME	DEFINITION	NAME	DEFINITION	NAME	DEFINITION	NAME	DEFINITION
INPUT SIGNAL	X0	Inspection input	X1	Inspection Up	X2	Inspection down	X3	Electric brake release 1
	X4	Electric brake release 2	X5	Multi function input	X6	ARD interlock contactor feedback	X7	Top terminal1
	X8	Bottom terminal 1	X9	Up leveling	X10	Down leveling	X11	Brake relay feedback 1
	X12	fire protection	X13	Thermal switch monitoring/ multi-function input	X14	overload	X15	Left brake feedback
	X16	Brake relay feedback 2	X17	STO feedback	X18	Spare	X19	Right brake feedback
	X20	Power drop detection	X21	Phase lost detection				
INPUT SIGNAL (SAFETY CIRCUIT 24V)	X29+	SAFETY CIRCUIT+	X30+	DOOR CIRCUIT +	X31+	HALL/CAR DOOR SHORT DETECTION 1+	X32+	HALL/CAR DOOR SHORT DETECTION 2+
	X29-	SAFETY CIRCUIT -	X30-	DOOR CIRCUIT -	X31-	HALL/CAR DOOR SHORT DETECTION 1-	X32-	HALL/CAR DOOR SHORT DETECTION 2-
	Note： X29-/X30-/X31-/X32- are shared COM。							
OUTPUT SIGNAL	Y1	Fire linkage output	Y2	Speed governor reset	Y3	Speed governor test	Y4	STO output
	Y5	Spare	Y6	Multi function output	Y7	Brake control output 1	Y8	Brake control output 2
	Y9	ARD enable output	Y10	EPB brake open output	Y11	Power control output	Y12	DOOR MOTOR AND BRAKE SWITCH TO CITY POWER
	Y13	EPB enable output						

2.6.2 SJT-CNT-3H00 car top box of villa lift

2.6.2.1 SJT-CNT-3H00 car top box function Introduction and Terminal Definition

SJT-CNT-3H00 villa lift car top box integrates car top control board, car top interface board, car top STOP, inspection switches and etc. It can achieve collection of car signal, output control and other functions.

This box is smart, good appearance, wall-mounted or flatwise install, suit for car top of villa lift.

SJT-CNT-3H00 contains iBL6-HDIO-BV6.1, iBL6-HDIO-TV6.2, and BL2000-JDB-V6.4 internally.

Note: SJT-CNT-3H00 car top box does not have interfaces such as top station, limit, and auxiliary command board. If there is a need to use this interface, our standard car top box product must be used.

Figure 2.7 tCar top box appearance

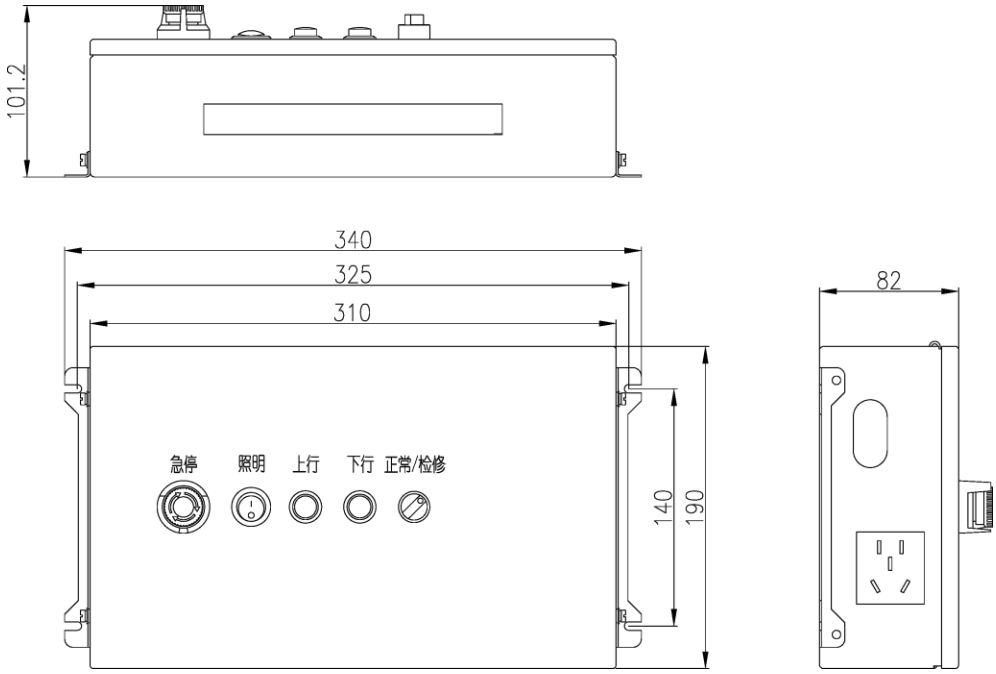


Figure 2.8 Dimension of car top box

CHART 2.4 CAR TOP BOX PORT INTRODUCTION

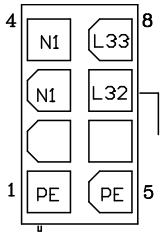
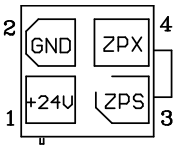
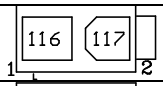
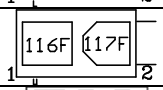
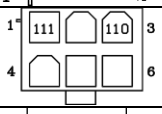
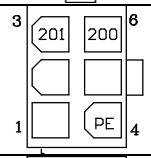
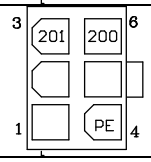
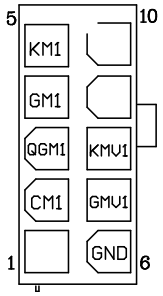
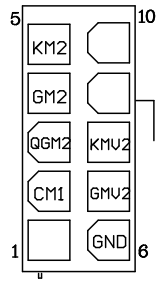
Plug	Port	Signal	function
CLF		CLF-1 PE	PE
		CLF-3 N1	Car fan AC220V-N
		CLF-4 N1	Car lamp AC220V-N
		CLF-5 PE	PE
		CLF-7 L32	Car fan AC220V-L（Disconnect when turn off fan）
		CLF-8 L33	Car lamp AC220V-L （ Disconect whenturn off lamp）
MQ1		MQ1-1 +24V	DC +24V （output）
		MQ1-2 GND	DC 0V（car top Input Signal GND）
		MQ1-3 ZPS	Up safety door zone（input）
		MQ1-4 ZPX	Down safety door zone（input）
GS1		GS1-1 116	Front car door 1
		GS1-2 117	Front car door 2
GS2		GS2-1 116F	Rear car door 1
		GS2-2 117F	Rear car door 2
SN4		SN4-1 111	Safety gear 1（Safety circuit）
		SN4-3 110	Safety gear 2（Safety circuit）
PC11		PC11-3 201	Front car door controller AC220V-N
		PC11-4 PE	PE
		PC11-6 200	Front car door controller AC220V-L
PC21		PC21-3 201	Rear car door controller AC220V-N
		PC21-4 PE	PE
		PC21-6 200	Rear car door controller AC220V-L
PC1		PC1-2 CM1	Front door motor open/close Signal COM
		PC1-3 QGM1	Front doornudge close（output）
		PC1-4 GM1	Front door close（output）
		PC1-5 KM1	Front door open（output）
		PC1-6 GND	Front door open/close limit Input Signal GND
		PC1-7 GMV1	Front doorclose limitSignal（input）
		PC1-8 KMV1	Front dooropen limitSignal（input）
PC2		PC2-2 CM1	rear door motor open/close Signal COM
		PC2-3 QGM2	rear doornudge close（output）
		PC2-4 GM2	rear door close（output）
		PC2-5 KM2	rear door open（output）
		PC2-6 GND	rear door open/close limit Input Signal GND
		PC2-7 GMV2	rear doorclose limitSignal（input）
		PC2-8 KMV2	rear dooropen limitSignal（input）

CHART 2.4 CAR TOP BOX PORT INTRODUCTION(Cont')

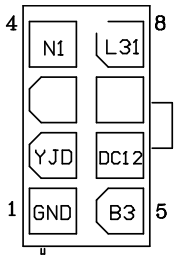
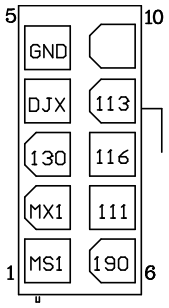
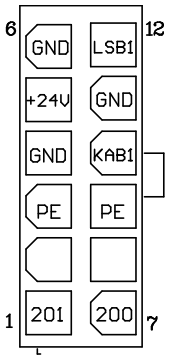
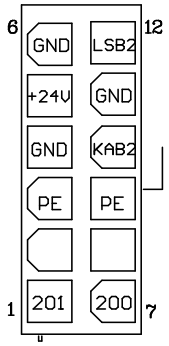
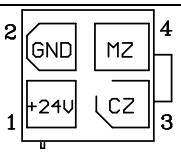
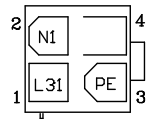
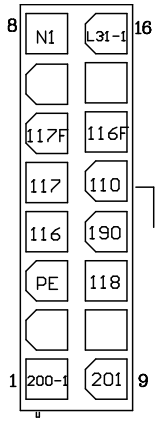
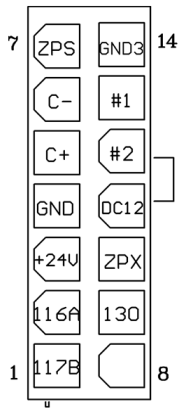
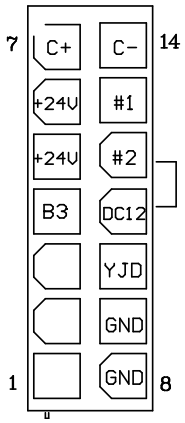
Plug	Port	Signal	function
IPS（Internal wiring）		IPS-1 GND	Emergency power GND （DC 0V）
		IPS-2 YJD	Emergency light power input （DC 12V）
		IPS-4 N1	AC220V-N （*output，Emergency power charge port）
		IPS-5 B3	Emergency bell input（*connect to GND to trigger）
		IPS-6 DC12	Emergency power input（DC12V）
		IPS-8 L31	AC220V-L （*output，Emergency power charge port）
DJX（Internal wiring）		DJX-1 MS1	Car top inspection up input
		DJX-2 MX1	Car top inspection down input
		DJX-3 130	Car top inspection input（parallel）
		DJX-4 DJX	Car top inspection input（serial）
		DJX-5 GND	Input Signal GND （DC 0V）
		DJX-6 190	Car top inspection（Safety circuit）
		DJX-7 111	Car top inspection（Safety circuit）
		DJX-8 116	Car top STOP switch（Safety circuit）
		DJX-9 113	Car top STOP switch（Safety circuit）
KAB1		KAB1-1 201	AC220V-N（Note：output，for front door light curtain power）
		KAB1-3 PE	PE
		KAB1-4 GND	DC 0V（car top board input GND）
		KAB1-5 +24V	DC +24V（output）
		KAB1-6 GND	DC 0V（car top board input GND）
		KAB1-7 200	AC220V-L（Note：output， for front door light curtain power）
		KAB1-9 PE	PE
		KAB1-10 KAB1	Front door safety edge Signal input
		KAB1-11 GND	DC 0V（car top board input GND）
		KAB1-12 LSB1	Front door light curtain Signal input
KAB2		KAB2-1 201	AC220V-N（Note：output， for rear door light curtain power）
		KAB2-3 PE	PE
		KAB2-4 GND	DC 0V（car top board input GND）
		KAB2-5 +24V	DC +24V （output）
		KAB2-6 GND	DC 0V（car top board input GND）
		KAB2-7 200	AC220V-L（Note：output， for rear door light curtain power）
		KAB2-9 PE	PE
		KAB2-10 KAB2	rear door safety edge Signalinput
		KAB2-11 GND	DC 0V（car top board input GND）
		KAB2-12 LSB2	rear door light curtain Signalinput
LW1		LW1-1 +24V	DC +24V （output）
		LW1-2 GND	DC 0V （car top board input GND）
		LW1-3 CZ	Overload（input）
		LW1-4 MZ	Full load（input）

CHART 2.4 CAR TOP BOX PORT INTRODUCTION(Cont')

Plug	Port	Signal	function
CZ1 (Internal wiring)		CZ1-1 L31	Car top lamp AC220V-L
		CZ1-2 N1	Car top lamp AC220V-N
		CZ1-3 PE	PE
DC3		DC3-1 200-1	Door controller power input AC 220V-L
		DC3-3 PE	PE
		DC3-4 116	Safety circuit (start point of car top safety and car door circuit)
		DC3-5 117	Front hall door and car door shorting point
		DC3-6 117F	Rear hall door and car door shorting point
		DC3-8 N1	Car top lamp power input(AC 220V-N)
		DC3-9 201	Door controller power input AC 220V-N
		DC3-11 118	Middle point between front door and rear door
		DC3-12 190	Safety circuit
		DC3-13 110	Safety circuit (safety gear)
		DC3-14 116F	Safety circuit (car door return point)
		DC3-16 L31-1	Car top lamp power input (AC 220V-L)
DC2		DC2-3 +24V	DC +24Vinput (car top and car power)
		DC2-4 GND	DC 0Vinput (car top and car power \inter GND)
		DC2-5 C+	CAN communication CANH
		DC2-6 C-	CAN communication CANL
		DC2-7 ZPS	Up safety door zone Input Signal
		DC2-9 130	Car top inspection switch wiring
		DC2-10 ZPX	Down safety door zone Input Signal
		DC2-11 DC12	Intercom DC12V power(back to machine room)
		DC2-12 #2	Car top and car Intercom #2
		DC2-13 #1	Car top and car Intercom #1
DC9-1		DC9-1-4 B3	Emergency bell output (***connect to GND to bell**)
		DC9-1-5 +24V	DC +24Voutput (for car)
		DC9-1-6 +24V	DC +24Voutput (for car)
		DC9-1-7 C+	Car CAN communication CAN-H
		DC9-1-8 GND	GND (Emergency power DC 0V, connect with DC24V GND)
		DC9-1-9 GND	GND (Emergency power DC 0V, connect with DC24V GND)
		DC9-1-10 YJD	Emergency light power output (DC 12V)
		DC9-1-11 DC12	Emergency power output (DC12V)
		DC9-1-12 #2	Car intercom #2
		DC9-1-13 #1	Car intercom #1
		DC9-1-14 C-	Car CAN communication CAN-L

2.6.2.2 BL2000-JDB-V6.4 car top board

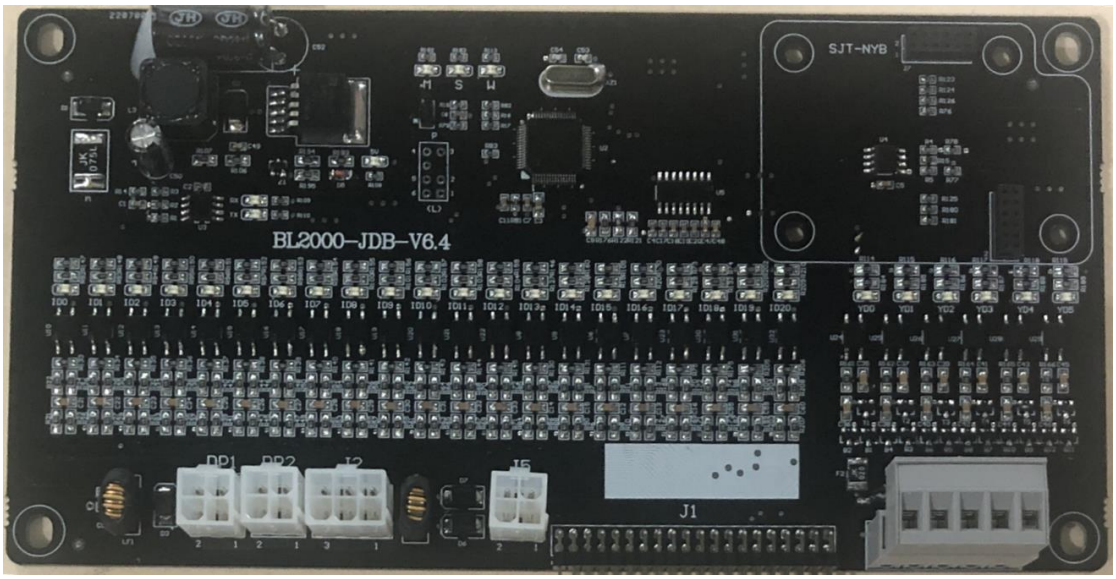


Figure 2.9 BL2000-JDB-V6.4 car top board

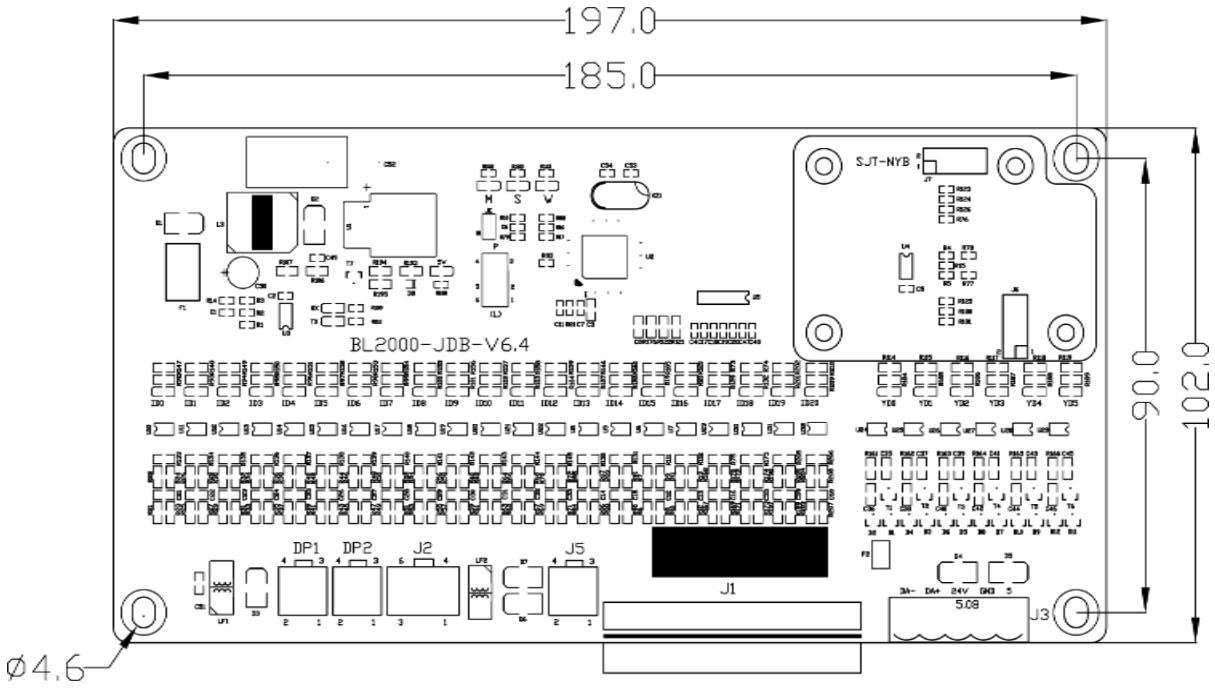


Figure 2.10 Component location and dimension of BL2000-JDB-V6.4

Chart 2.5 Port of car top board

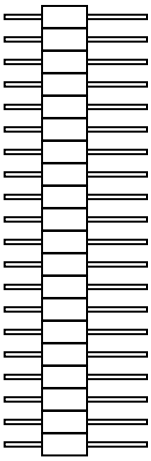
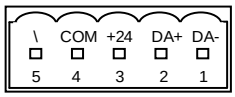
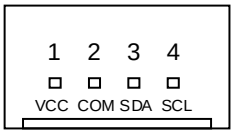
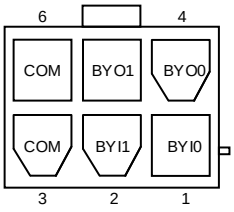
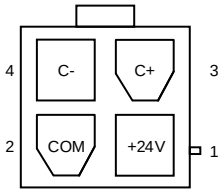
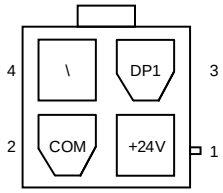
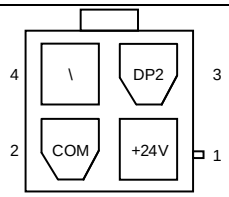
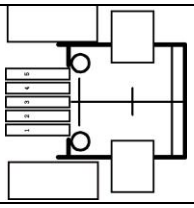
Plug	Port	Signal	function
J1	 2.54 2*20P	J1-1	J1-2~J1-7 output COM
		J1-2	nudge close2output
		J1-3	Close 2output
		J1-4	Open 2output
		J1-5	nudge close1output
		J1-6	Close 1output
		J1-7	Open 1output
		J1-8	Arrival gone output
		J1-9	Fan output
		J1-10	Lamp output
		J1-11	Door bypass warning output
		J1-12	Down leveling input
		J1-13	Inspection down input
		J1-14	Up leveling input
		J1-15	Inspection input
		J1-16	Inspection up input
		J1-17	Full load input
		J1-18	Overload input
		J1-19	Light load input
		J1-20	Half load input
		J1-21	Safety edge 2input
		J1-22	Light curtain 2input
		J1-23	Open limit 2input
		J1-24	Close limit 2input
		J1-25	Safety edge 1input
		J1-26	Light curtain 1input
		J1-27	Open limit 1input
		J1-28	Close limit 1input
		J1-29	CAN Bus L
		J1-30	
		J1-31	CAN Bus H
		J1-32	
		J1-33	24V input GND
		J1-34	
		J1-35	
		J1-36	
		J1-37	24V input
		J1-38	
		J1-39	
		J1-40	

Chart 2.5 Port of car top board (cont')

Plug	Port	Signal	function
J3		J3-1	RS485 RT-
		J3-2	RS485 RT+
		J3-3	24V
		J3-4	GND
J4 [V6.3]		J4-1	5V
		J4-2	GND
		J4-3	I2C SDA
		J4-4	I2C SCL
J2		J2-1	Spareinput0
		J2-2	Spareinput1
		J2-3	GND[note2]/+24V[note1]
		J2-4	Spareoutput1（OC output）
		J2-5	Spareoutput2（OC output）
		J2-6	Spare output COM
J5		J5-1	Spare24Vinput
		J5-2	Spare24VinputGND
		J5-3	Spare CAN BUS H
		J5-4	Spare CANBUS L
DP1 [V6.4]		DP1-1	24V
		DP1-2	GND
		DP1-3	Front door motor overheat
		DP1-4	Null
DP2 [V6.4]		DP2-1	24V
		DP2-2	GND
		DP2-3	Rear door motor overheat
		DP2-4	Null
USB1 [Voice announcement]		USB1	Arrival gone and voice announcement USB port

LS		LS	Arrival gone and voice announcement port

Chart 2.6 LED indicator on car top board

LED	Function
W	Working indicator of car top board
5V	Power indicator
RX	CAN receive indicator
TX	CAN send indicator
M	Indicator of communication with main board（ON：with communication；OFF：no communication）
S	Indicator of communication with sub command board（ON：with communication；OFF：no communication）
ID0	Open limit 1 input（ON: breakover；OFF: No breakover）
ID1	Close limit 1 input（ON: breakover；OFF: No breakover）
ID2	Safety edge 1 input（ON: breakover；OFF: No breakover）
ID3	Light curtain 1 input（ON: breakover；OFF: No breakover）
ID4	Open limit 2 input（ON: breakover；OFF: No breakover）
ID5	Close limit 2 input（ON: breakover；OFF: No breakover）
ID6	Safety edge 2 input（ON: breakover；OFF: No breakover）
ID7	Light curtain 2 input（ON: breakover；OFF: No breakover）
ID8	Light load input（ON: breakover；OFF: No breakover）
ID9	Half load input（ON: breakover；OFF: No breakover）
ID10	Full load input（ON: breakover；OFF: No breakover）
ID11	Overload input（ON: breakover；OFF: No breakover）
ID12	Inspection input（ON: breakover；OFF: No breakover）
ID13	Inspection Up input（ON: breakover；OFF: No breakover）
ID14	Inspection Down input（ON: breakover；OFF: No breakover）
ID15	Up leveling input（ON: breakover；OFF: No breakover）
ID16	Down leveling input (ON: breakover；OFF: No breakover）
ID17	Spared input 0 （ON: breakover；OFF: No breakover）
ID18	Spared input 1 （ON: breakover；OFF: No breakover）
ID19[Note1]	Front door motor overheat input （ON: breakover；OFF: No breakover）
ID20[Note1]	Rear door motor overheat input （ON: breakover；OFF: No breakover）
YD0	Open door 1 output （ON: breakover；OFF: No breakover）
YD1	Close door 1 output （ON: breakover；OFF: No breakover）
YD2	Force close 1 output （ON: breakover；OFF: No breakover）
YD3	Open door 2 output （ON: breakover；OFF: No breakover）
YD4	Close door 2 output （ON: breakover；OFF: No breakover）
YD5	Force close 2 output （ON: breakover；OFF: No breakover）

Note 1：For BL2000-JDB-V6.4 and later versions.

Note 2： For BL2000-JDB-V6.3 and previous versions.

2.6.2.3 iBL6-HDIO-BV6.1 and iBL6-HDIO-TV6.2 Car Top Interface Board

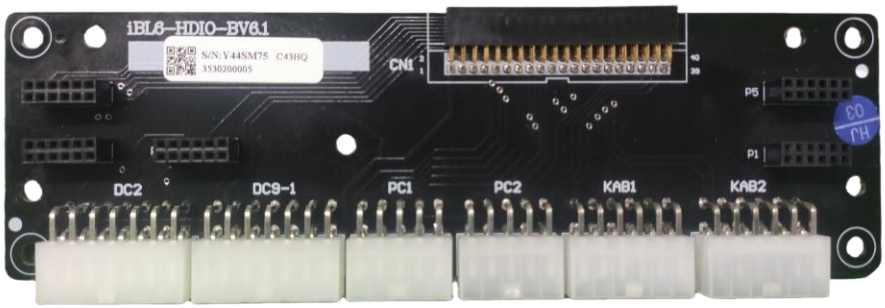


Figure 2.11 iBL6-HDIO-BV6.1 car top Interface board

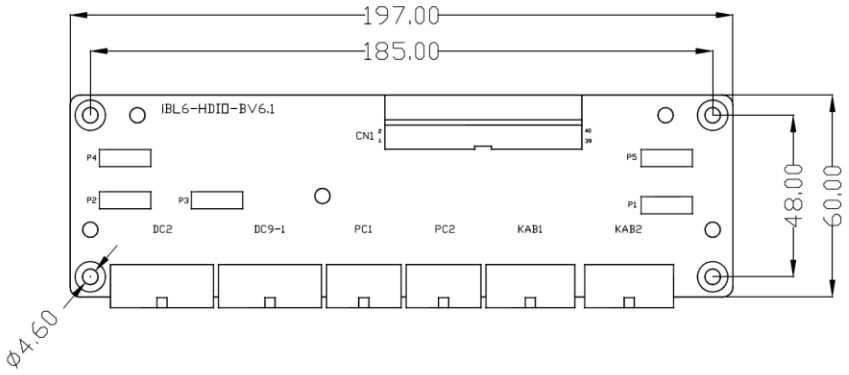


Figure 2.12 Component location and dimension of iBL6-HDIO-BV6.1

Figure 2.13 iBL6-HDIO-TV6.2 car top Interface board

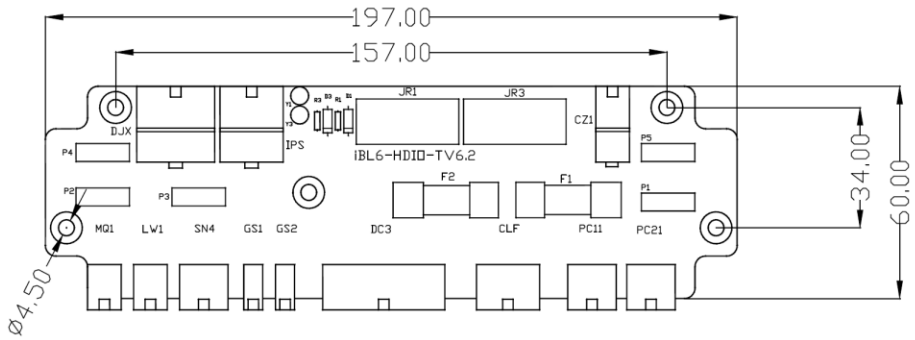


Figure 2.14 Component location and dimension of iBL6-HDIO-TV6.2

2.6.3 BL2000-ZLB-H6 Villa Elevator Modular Instruction Board

BL2000-ZLB-H6 villa elevator modular instruction board is installed in the car control box, which mainly completes the input and response of car call buttons and door opening and closing buttons.

The car top panel and the command board are connected by cables. The car top panel can only connect the main command board, or connect the main command board and the auxiliary command board at the same time.

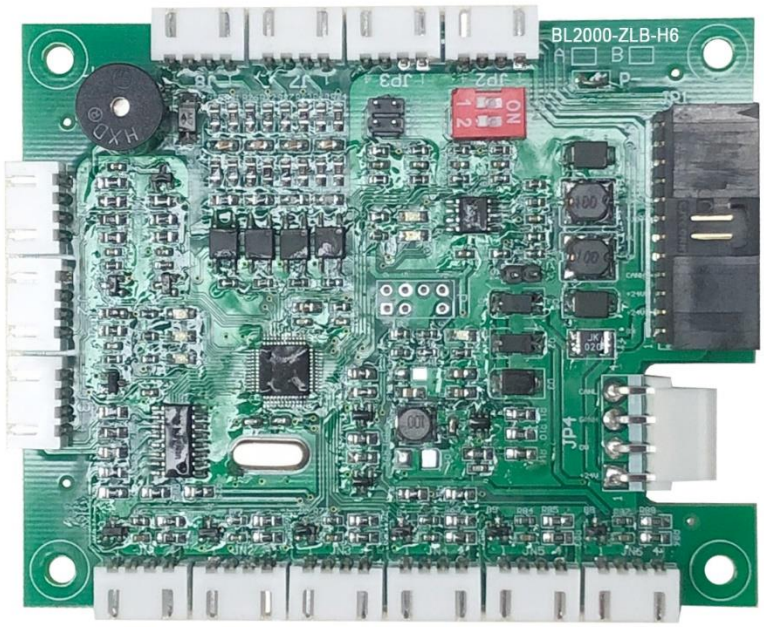


Figure 2.15 BL2000-ZLB-H6 Villa Elevator Modular Instruction Board

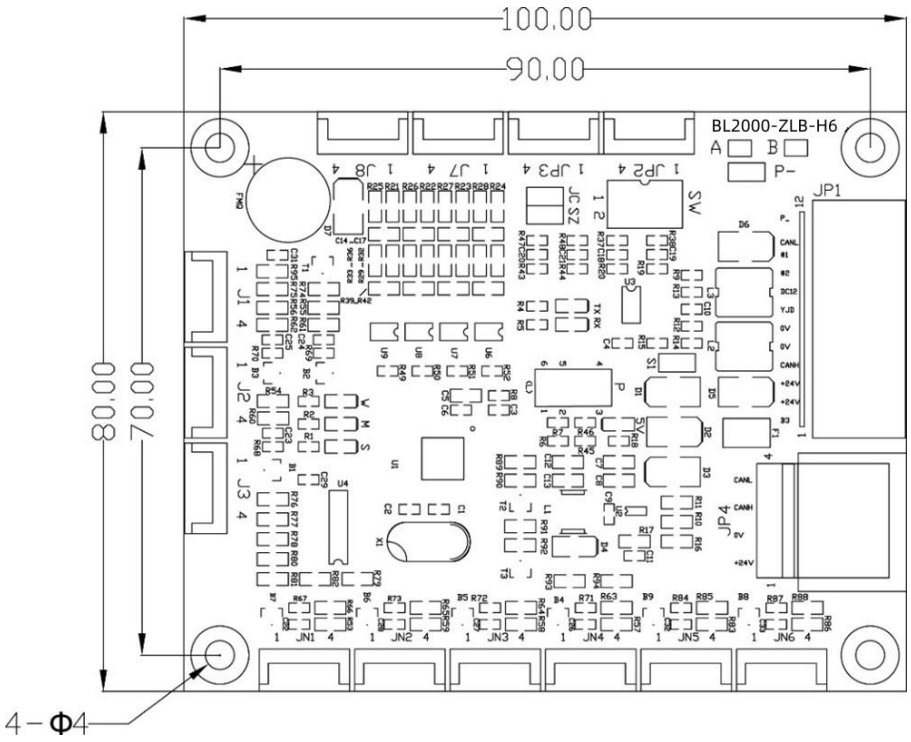


Figure 2.16 Component location and dimension of BL2000-ZLB-H6

Chart 2.7 Interface definition and specification

name	port	position	definition	purpose	Interface technical specifications	
					Interface form	Rated load
JN1 - JN6 2.54/4P		JNn-1	Answer output	Internal selection input response output of layers 1-6	OC gate	Current limiting resistance560Ω
		JNn-2	24V			
		JNn-3	24V		Resistance voltage divider	
		JNn-4	car call input			
J1 2.54/4P		J1-1	Door opening button response	Door opening button and response	OC gate	Current limiting resistance560Ω
		J1-2	24V			
		J1-3	24V		Resistance voltage divider	
		J1-4	Door opening button input			
J2 2.54/4P		J2-1	Door closing button response	Door closing button and response	OC gate	Current limiting resistance 560Ω
		J2-2	24V			
		J2-3	24V		Resistance voltage divider	
		J2-4	Door closing button input			
J3 2.54/4P		J3-1	Fan control button response	Fan control button and response	OC gate	Current limiting resistance 560Ω
		J3-2	24V			
		J3-3	24V		Resistance voltage divider	
		J3-4	Fan control button input			
J7 2.54/4P	CMM	J7-1	Input common terminal	Fan switch input		

	FAN	J7-2	Fan switch input		Optocoupler input	
	CMM	J7-3	Input common terminal	Lighting switch input		
	LIGNT	J7-4	Lighting switch input		Optocoupler input	
J8 2.54/4P	CMM	J8-1	Input common terminal	Spare input		
	BYI0	J8-2	Spare input 0		Optocoupler input	
	CMM	J8-3	Input common terminal	Spare input		
	BYI1	J8-4	Spare input 1		Optocoupler input	

Chart 2.7 Interface definition and specification (cont')

name	port	position	definition	purpose	Interface technical specifications	
					Interface form	Rated load
JP1 2.54/12P Terminal with buckle	B3	JP1-1	Alarm key input	Car roof communication port		
	24V	JP1-2	Power supply 24V input			
	24V	JP1-3	Power supply 24V input			
	CANH	JP1-4	CAN bus H			
	0V	JP1-5	Power ground G			
	0V	JP1-6	Power ground G			
	YJD	JP1-7	Emergency light output			
	DC12	JP1-8	Intercom power supply 12V			
	#2	JP1-9	Intercom communication line			
	#1	JP1-10	Intercom communication line			
	CANL	JP1-11	CAN bus L			
	P_	JP1-12	Power ground G1			
JP2 2.54/4P	DC12	JP2-1	Intercom power supply 12V	Car intercom port		
	P_	JP2-2	Power ground G1			
	#1	JP2-3	Intercom communication line			
	#2	JP2-4	Intercom communication line			
JP3 2.54/4P	YJD	JP3-1	Emergency light output+	Emergency light output		
	P_	JP3-2	Emergency light output-			
	P_	JP3-3	Power ground G1	Alarm button		
	B3	JP3-4	Alarm key input			
JP4 3.96/4Pcurved	24V	JP4-1	Power supply+24V	CAN communication port		
	0V	JP4-2	Power ground G			
	CANH	JP4-3	CAN bus H			
	CANL	JP4-4	CAN bus L			
JC	Test setup jumper					

SZ	Function setting jumper	
P	Short circuit jumper between power ground G and power ground G1	
SW	SW-1	See 2.8 Select program functions
	SW-2	

Chart 2.8 function setting

SW DIP switch		Select program functions	Function description
SW-1	**SW-2**		
OFF	OFF	Main Command Board – Standard Program	Used as the main command board in the lift car
OFF	ON	Single command board through door program [Note] [NOTE]	It can be configured as staggered penetration (default configuration) or full penetration
ON	OFF	Sub command board	Used as an ordinary auxiliary command board in the lift car
ON	ON	Through door auxiliary command board	Used as the auxiliary command board of the through door in the lift car

Note:BL2000-ZLB-H6 supports up to 6 internal selectable inputs, does not support connection to expansion boards, and does not support communication style IC card functionality.

If the demand for internal input exceeds 6 channels, or if there is a demand for communication type IC cards, the BL2000-ZLB-V6.2 command board needsto be used.

2.6.4 HPOB.VH1.2 brake power board

The brake power board can provide DC110V brake power supply, system bus DC24V power supply, and safety circuit DC24V power supply to the control cabinet interface board.

1. Brake power supply

This brake power board can provide a DC110V opening voltage. After the opening signal is effective, establish DC110V according to the preset slope within about 1 second, maintain it for 2 seconds, and then enter the half voltage maintenance stage (half voltage maintenance voltage 87v). And it also integrates two feedback points of the holding brake relay internally, used for system monitoring of the holding brake voltage output status.

The maximum output power is 230W when the opening voltage is DC110V, and the maximum output power is 140W when maintaining the voltage.

2. Safety circuit DC24V power supply

The safety circuit is powered by 24V, and this power board provides a 0.5A safety circuit power supply.

3. System bus DC24V power supply

Provide power supply for the external bus and control switches of the system, with a rated current of 2.4A.

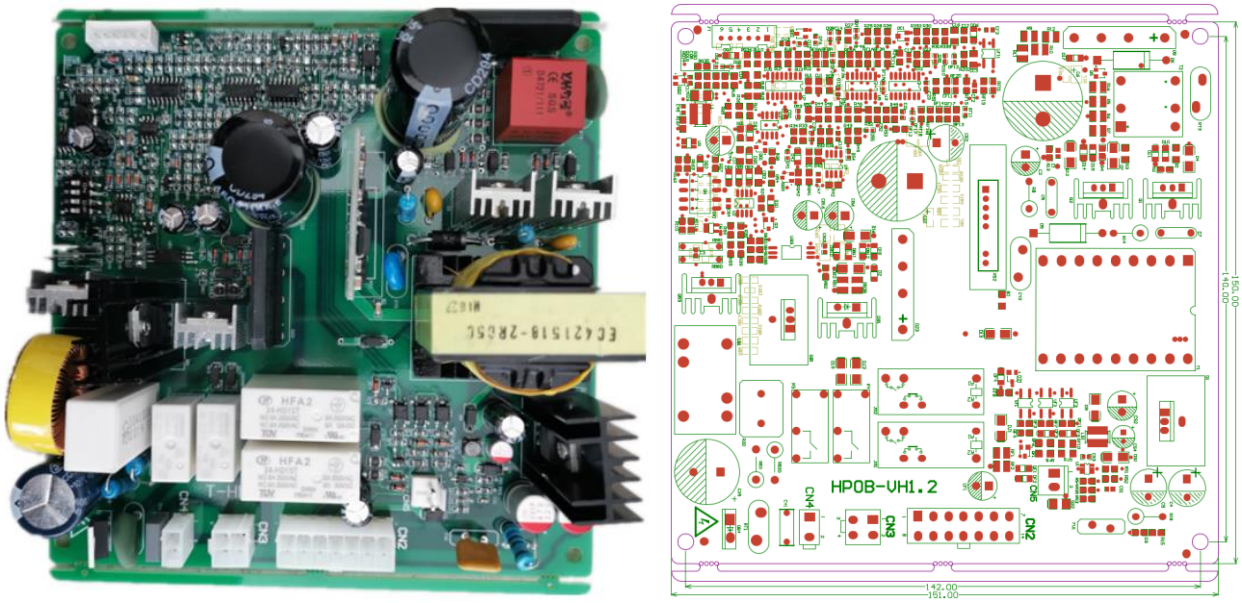
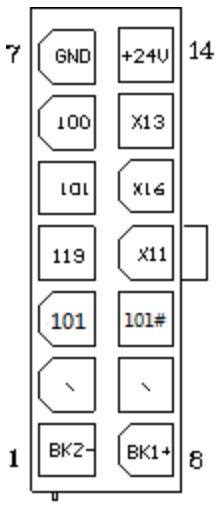
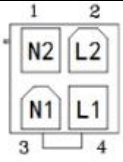


Figure 2.17 HPOB.VH1.2 brake power board

Chart 2.9 Brake power board port definition

Plug	Port	Signal	Function
CN2 Brake power and system power output		CN2-1 BK2-	Brake power-（DC110）
		CN2-2 \	Null
		CN2-3 101	安全回路电源-（0V）
		CN2-4 119	Brake control input+
		CN2-5 101	Safety circuit power-（24V）
		CN2-6 100	Safety circuit power +（24V）
		CN2-7 GND	Control power GND
		CN2-8 BK1+	Brake power +（DC110）
		CN2-9 \	Null
		CN2-10 101#	Brake control input-
		CN2-11 X11	Brake relay feedback 1
		CN2-12 X16	Brake relay feedback 2
		CN2-13 X13	Relay feedback common terminal
		CN2-14 +24V	Control power 24V
CN3 AC power input		CN3-1 N2	AC power N2
		CN3-2 L2	AC power L2
		CN3-3 N1	AC power N1
		CN3-4 L1	AC power L1

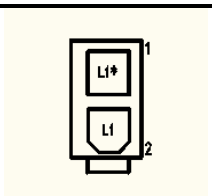
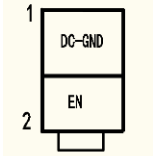
CN4		CN4-1 L1*	Relay control 1
		CN4-2 L1	Relay control 2
CN5		CN5-1 DC-GND	COM
		CN5-1 EN	Enable pin

Chart 2.10 Brake power board port definition(Other categories)

CN2	Band brake power supply and system power output terminals
CN3	AC power input terminal
CN4	Brake control terminal
CN5	Brake enable terminal
DIP switch SK1	When dialing 1-3 as off, the ramp time is about 1 second. When dial 1 is on and 2-3 is off, the ramp time is about 0.5 seconds. When dialing 1-2 as on and 3 as off, the ramp time is about 0.3 seconds. When dialing 1-3 as on, the ramp time is about 0.2 seconds. When dial 4 is on, the opening voltage output of the brake voltage is 110Vdc, and the maintenance voltage is 87Vdc. When dial 4 is off, the opening voltage output of the holding brake voltage is 80Vdc, and the maintenance voltage is 63Vdc.

2.6.5 HSPG_V6F interface board

2.6.5.1 Interface board

HSPG_V6F interface card is a type of SIN/COS encoder for general gearless motor. This card works with 5V SIN/COS encoder. Gearless motor use signal（A/B/R/C/D）.（Suit for Heidenhan 1387 encoder).HSPG_V6F interface board is shown in figure 2.18.

Figure 2.18 HSPG_V6F card appearance

2.6.5.2 HSPG_V6F interface card terminal Definition and function description

HSPG_V6F interface card terminal Definition and function description is shown in chart 2.11.

Chart 2.11 HSPG_V6F interface card terminal Definition and function description

Name	Label	Location	Definition	Usage	Specification			
					type	Rated load	ON/OFF time	Max speed
JG1	B–	JG1-1	B–	differential Signal B–	differential input			40KHz
	*	JG1-2	—	—	—			
	R+	JG1-3	R+	differential Signal R+	differential input			40KHz
	R–	JG1-4	R–	differential Signal R–	differential input			40KHz
	A+	JG1-5	A+	differential Signal A+	differential input			40KHz
	A–	JG1-6	A–	differential Signal A–	differential input			40KHz
	0V	JG1-7	GND	5V GND	Power GND			
	B+	JG1-8	B+	differential Signal B+	differential input			40KHz
	5V	JG1-9	+5V	5V Power	Power output	+500mA/5 V±2.5% Voltage ripple less than 50mV		
	C–	JG1-10	C–	differential Signal C–	differential input			40KHz
	C+	JG1-11	C+	differential Signal C+	differential input			40KHz
	D+	JG1-12	D+	differential Signal D+	differential input			40KHz
	D–	JG1-13	D–	differential Signal D–	differential input			40KHz
	*	JG1-14	—	—	—			
	*	JG1-15	—	—	—			

2.6.7.3 HSPG_V6F interface card usage introduction and caution.

1） SIN/COS PG card can supply 5V±2.5%/500mA power output for external encoder. If the required current of external circuit exceed current output capacity, it may cause PG card output overcurrent frequently and damage PG card. Seriously it may cause external encoder damage.

2）The requirement of Analog Input Signal cut-off frequency is no more than 40KHz. This is decided by inner filter circuit. If the bandwidth of input signal exceeds given range, PG card will not be able to analyze signal and may cause inverter work abnormally.

2.6.6 HPG_V6X interface board

2.6.6.1 Interface board

HPG_V6X interface card is async machine universal pulse encoder speed feedback card.
HPG_V6X is in supporting use of 12V OC output type, and push-pull output pulse encoder. Encoder for async machine: A/B. Diagram is shown in Figure 2.19 below.

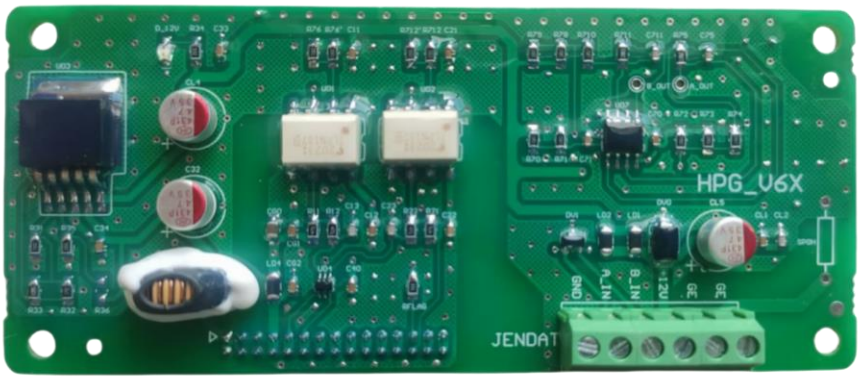


Figure 2.19 HPG_V6X card appearance

2.6.6.2 HPG_V6X Interface card diagram

HPG_V6X interface card terminal Definition and function description is shown in chart 2.12.

Chart 2.12 HPG_V6X interface card terminal Definition and function description

Name	Label	Location	Definition	Usage	Specification			
					type	Rated load	ON/OFF time	Max speed
JENDATA（short for JEN）	GND	JEN-1	Power supply Ground	Power supply Ground	Power supply Ground	—	—	—
	A_IN	JEN-2	OC/Push-pull type input A	Input signal A	OC/push-pull input	-10mA/12V-15V	—	500KHz
	B_IN	JEN-3	OC/Push-pull type input B	Input signal B	OC/push-pull input	-10mA/12V-15V	—	500KHz
	+12V	JEN-4	OC/push-pull power supply	12V Power supply	Power supply output	+150mA/12V±5%	—	—
	GE	JEN-5	Shield Ground	Shield Ground	—	—	—	—
	GE	JEN-6	Shield Ground	Shield Ground	—	—	—	—

2.6.6.3 Precautions for using HPG_V6X card

For the push-pull/OC output encoder interface of the HPG_V6X card, the input pulse signal frequency is required to be no more than 500 KHz, the parameter of the input and output signal current and voltage cannot exceed the range given in the chart above.

If the parameter of the input and output signal current and voltage exceed the given range, the PG interface card may not work normally, even PG card and encoder get damaged.

Manufacturer suggests that if the external circuit working condition is not well, please do not power other circuits except the encoder by using the HPG_V6X interface card +5V power supply to avoid PG card being interfered or damaged.

Please note that user will take responsibility for the consequence caused by the reasons above.

2.6.7 HSPG_V6E interface board

2.6.7.1 Interface board

HSPG_V6E interface card is a type of SIN/COS encoder for synchronous motors.

This card works with 5V SIN/COS encoder. Synchronous motor use signal（A/B/C/D）.（Suit for Heidenhan 1313 encoder).HSPG_V6E interface board is shown in figure 2.20.

Figure 2.20 HSPG_V6E card appearance

2.6.7.2 HSPG_V6E Interface card diagram

HSPG_V6E interface card terminal Definition and function description is shown in chart 2.13.

Chart 2.13 HSPG_V6E interface card terminal Definition and function description

Name	Label	Location	Definition	Usage	Specification			
					type	Rated load	ON/OFF time	Max speed
JG1	B–	JG1-1	B–	differential Signal B–	differential input	—	—	40KHz
	*	JG1-2	—	—	—	—	—	—
	*	JG1-3	—	—	—	—	—	—
	*	JG1-4	—	—	—	—	—	—
	A+	JG1-5	A+	differential Signal A+	differential input	—	—	40KHz
	A–	JG1-6	A–	differential Signal A–	differential input	—	—	40KHz
	0V	JG1-7	GND	5V GND	Power GND	—	—	—
	B+	JG1-8	B+	differential Signal B+	differential input	—	—	40KHz
	5V	JG1-9	+5V	5V Power	Power output	+500mA/5 V±2.5% Voltage ripple less than 50mV	—	—
	C–	JG1-10	Clock C–	differential Signal C–	differential input	—	—	40KHz
	C+	JG1-11	Clock C+	differential Signal C+	differential input	—	—	40KHz
	D+	JG1-12	Data D+	differential Signal D+	differential input/output	—	—	40KHz
	D–	JG1-13	Data D–	differential Signal D–	differential input/output	—	—	40KHz
	*	JG1-14	—	—	—	—	—	—
	*	JG1-15	—	—	—	—	—	—

2.6.8 HARD-V5 emergency power board

This power board combines emergency rescue and electric brake release function together. According to system running status, it will automatically judge and decide system to enter status, without gap, intelligent and reliable. Considering safety specification of villa lift, it uses 12AH high capacity lead acid long-lifetime battery, and built-in charge/discharge management circuit. Lead acid battery has high safety level and avoid hidden danger because of charge and discharge.

ARD Running

Power on the system and run normally. When detecting power drop of the power grid, after presetting time, ARD will start running. Move elevator from non-leveling position to nearest stoppable floor, open the door and release passenger. If elevator is already at leveling position when ARD start, it will immediately open door. After keeping door open for 30 seconds, elevator will automatically close door and stop running. After presetting time of ARD running, it will automatically shut down.

Electric Brake Release Running

After ARD running and entering power off status, or switch off the main power breaker in cabinet, after system lost power, switch control system to emergency electric running mode. Press brake release start button, then electric brake release function will start. When elevator is at non-leveling position, press both COM and Force button at same time, system will open brake and elevator will move in low speed with the partial load of car and counterweight. When detecting leveling sensor, it will stop automatically. At leveling position, if it need to continue running, press COM and Force button again. After leaving leveling zone, it will stop automatically.

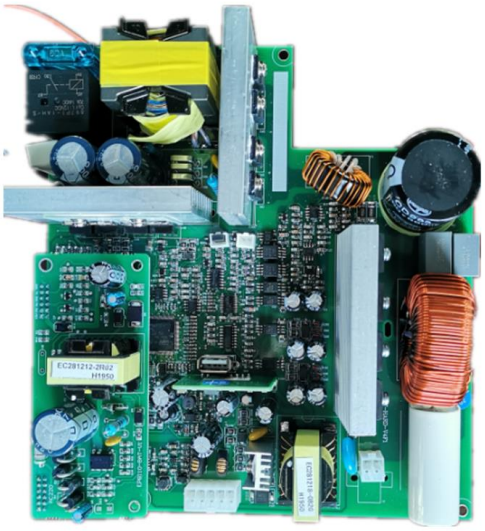
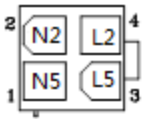
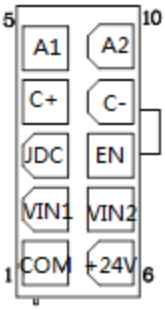


Figure 2.21 HARD-V5 emergency power board

Chart 2.14 HARD-V5 Emergency power board port introduction

Plug	Port	Signal	Function
J1 ARD to IO interface board		J1-1	AC220 Power N output to interface board
		J1-2	AC220 Power N2 input
		J1-3	AC220Power L output to interface board
		J1-4	AC220 Power L2 input
J2 ARD to IO interface board		J2-1	24V Power COM
		J2-2	Phase lost detection signal input
		J2-3	Main contactor control output
		J2-4	CAN+
		J2-5	ARD+13V power
		J2-6	+24V power
		J2-7	Power drop detection signal input
		J2-8	ARD enable signal input
		J2-9	CAN-
		J2-10	Start button signal

2.6.9 Operation box in cabinet

1. Interface of operation box

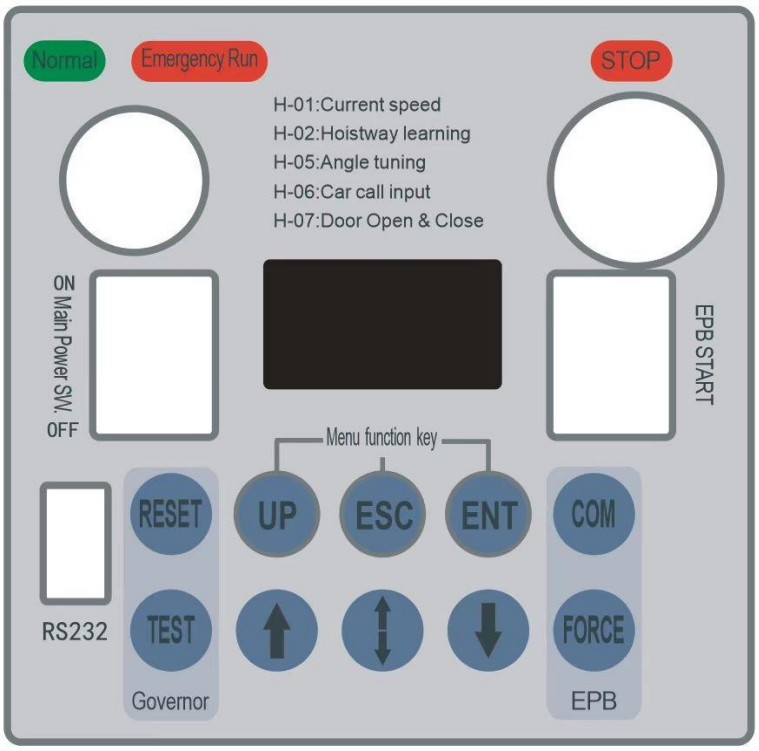


Figure 2.22 Operation interface

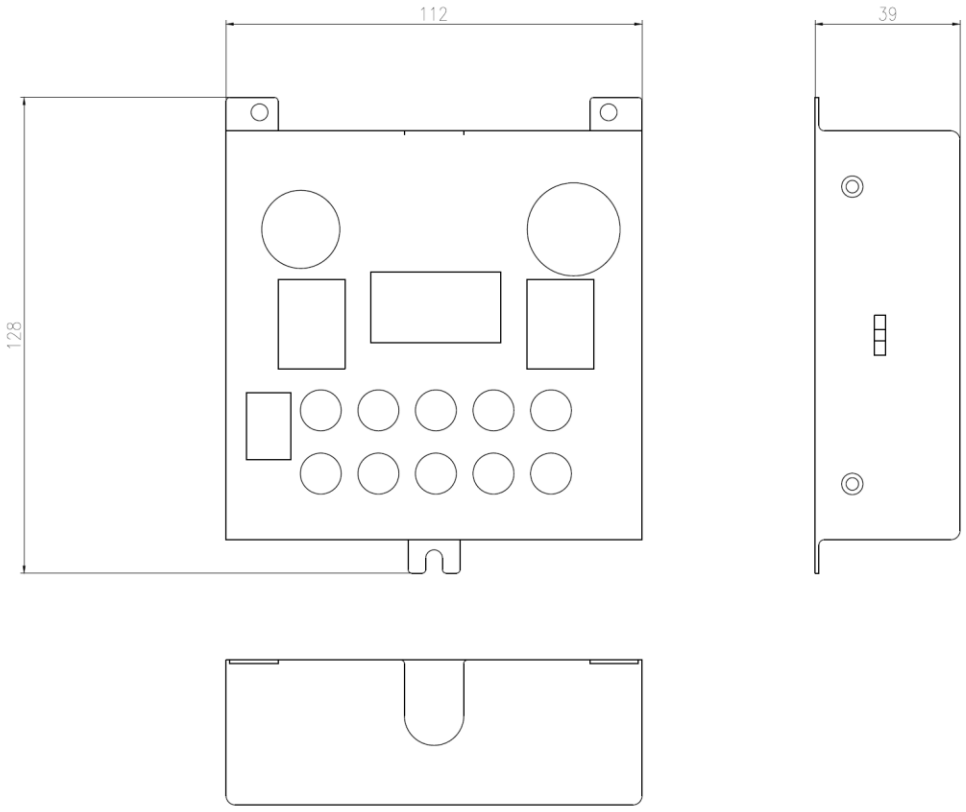


Figure 2.23 Dimension drawing of operation box (unit: mm)

Chart 2.15 Test and emergency operation on panel

Function	Lable	Description
Main Power Switch	Main Power SW.	Control contactor for power control of cabinet

Safety Switch	STOP	Cut off or recover safety circuit
Emergency operation	Emergency Run	In emergency status, press both UP and COM for emergency up running, press DOWN and COM for emergency down running.
		
		
		
Speed governor test	Governor TEST	In emergency status, test speed governor by speed governor test/reset button.
	Governor RESET	
Electric brake release	EPB START	After totally cutting off cabinet power, keeppressing this button for 3s, ARD power chip will be active.
	EPB COM	Press COM and force, the electric brake release circuit will output, brake will be opened and motor will slide toward light load direction.**Note: Brake release function can only be used after totally power off.**
	EPB FORCE	
Menu button	UP	Long press ENT for 3S, it will enter small keypad parameter adjusting interface. Use Up to adjust parameter, use ESC to exit.
	ESC	
	ENT	
RS232 communication port	RS232	Connect to operator for elevator debugging.

2. Monitor function of operation box

1）Show floor and running direction of elevator in normal condition.

2）Show fault code of elevator when in fault status.

3）Enter to small keypad adjusting interface through menu function key, which includes：

H-01：Current elevator speed

H-02：Hoistway learning

H-05：Angle tuning

H-06：Floor selection

H-07：Open & Close door

3. Application of operation box

1）Speed governor test and reset

Operation steps：

1. Turn emergency operation switch to Emergency status；

2. Press speed governor test button, speed governor test power will output and speed governor will act.

3. Release speed governor test button, and press speed governor reset button, speed governor reset power will output and reset speed governor.

2）Shorting operation for safety circuit

The operation box supplies shorting function for safety circuit. The location of shorting port is as following：

Take operation box and open its cover plate at back side, we can see 4P terminal (3.81 spacing) with label J8.

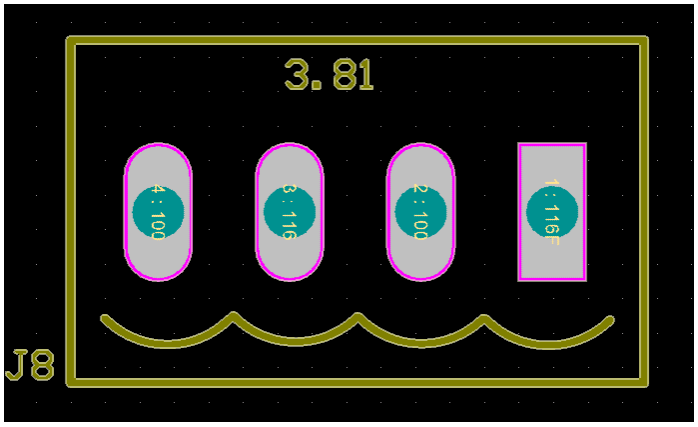


Figure 2.24 J8 terminal in operation box

This terminal supplies 100,116,116F of safety circuit for shorting operation.

Note： Remove shorting wires before normal running, otherwise it may cause serious danger !

100-116 Shorting safety circuit

116-116F Shorting hall door circuit

100-116F Safety circuit and hall door circuit

2.7. Confirmation upon Delivery

Check below items when receiving the products.

Chart 2.16 Things to check upon delivery

NOTES	METHOD
Check if product model is correct.	Check the model on the nameplate.
Check if product is broken.	Check exterior for any damage caused by shipment.
Check if mounting structure is loose.	Check mounting structure. Tighten the loose components with a screw driver, if required.
Check if main control board is loose.	Remove the front cover and check mounting structure. Tighten the loose component switch a screw driver, if required.

With any abnormalities above, please contact the company or regional office.

2.8. Installation

2.8.1 Installation Site

Install NS05 series villa lift control cabinet in an area that meets the requirements listed in chart 2.17.

Chart 2.17 Installation Environment Requirements

Type	Ambient Temperature	Ambient Humidity
Wall-mounted	-10°C~+45°C	5~95%RH (No condensation)
Floor type	-10°C~+40°C	5~95%RH (No condensation)
Embeded type	-10°C~+40°C	5~95%RH (No condensation)

Installation of controller should note the following:

1. Install the controller in a clean location which is free from oil mist and dust, or in a fully closed control cabinet which is completely shielded from floating dust.
2. Install the controller in a place which metal powder, oil, water, and other foreign bodies cannot enter.
3. Do not install the controller in or nearby wood and other combustibles.
4. Install the controller in a place without radioactive substances.
5. Install the controller in a place without harmful gas and liquid.
6. Install the controller in a place without vibration.
7. Install the controller in a place without chlorides.
8. Install the controller in a place without direct sunlight.

2.8.2 Temperature Requirement

To enhance the reliability, the controller should be installed in an environment temperature is not easy to rise. When installed in a cabinet, cooling fans or air conditioner are required to keep air temperature in the cabinet below 45°C.

2.8.3 Protect the controller from Foreign Object

Place a cover over the controller during installation to shield it from metal powder produced by drilling. Be sure to remove the cover from the controller after the completion of installation. Otherwise, ventilation will be reduced, causing the controller to overheat.

2.8.4 Removing and attaching the Terminal Cover

Refer to Figure 2.25-2.29. Note the open type NS05 series integrated controller terminal cover need not remove or attach.

Wall-mounted type

Both integrated installation and split installation can be selected. Use M8 expansion bolt and mount cabinet on the wall. Please notice the distance between cabinet and all around to ensure heat dissipation. Installation dimension is shown in following drawing.（Uint：mm）

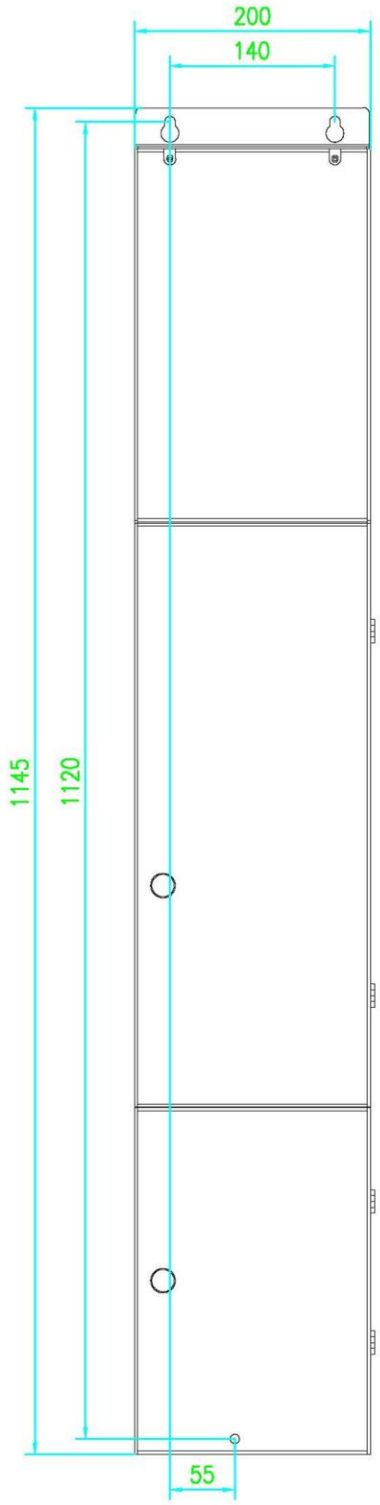


Figure 2.25 Wall-mounted installation（integrated）

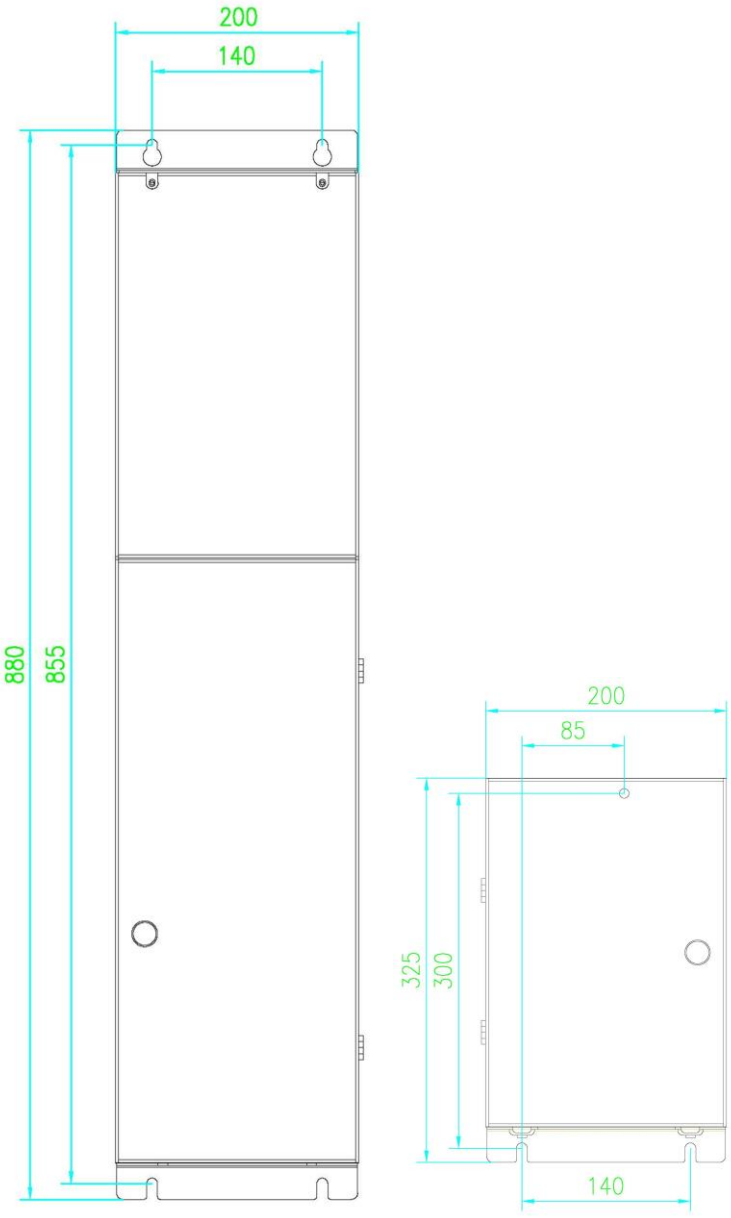


Figure 2.26 Wall-mounted installation（split type）

Floor type

Floor type installation can be not fixed on the wall, but need to ensure its stability of installation. Ensure the cabient will not move because of some reason.

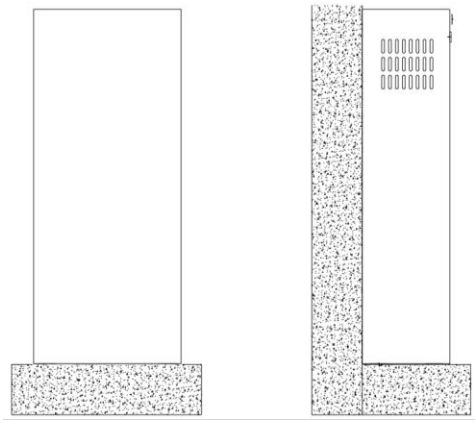


Figure 2.27 Floor type installation

Embeded type

EMBEDED TYPE OF INSTALLATION CAN EMBED CABINET INTO THE WALL OR SHAFT. (LOCATION HOLE REFERS TO WALL-MOUNTED INSTALLATION)

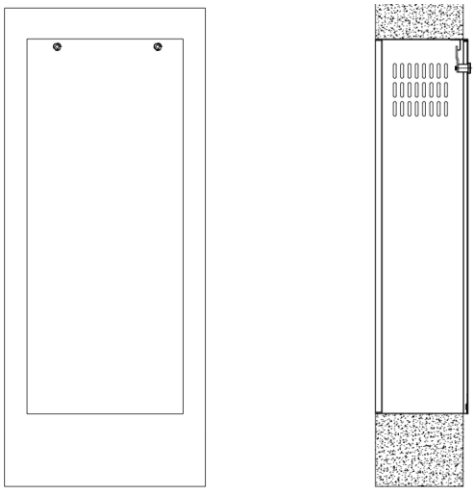


Figure 2.28 Embedded type installation

2.8.5 Installation of braking resistor box

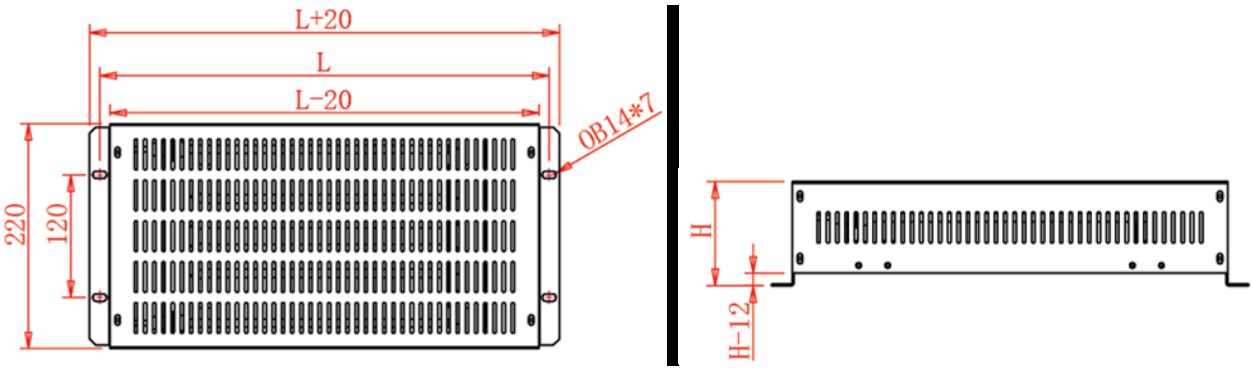


Figure 2.29 Braking resistor box installation

2.9. Product Function

Functions list shown in chart 2.18-2.21 .

Chart 2.18 Basic Function List

No.	Name	Purpose	Description	Note
1	Automatic Run		1.Door auto open at stop; 2.Door auto close in delay time; 3.Door close at close button pushed; 4.Car call register, auto cancel wrong call; 5.Landing call stop car in same direction 6. Car service opposite direction landing call at top/bottom floor	1. Turn all inspection switch to normal state; 2. Turn Auto/Attendant switch to Auto state; 3. The other two Auto/Inspection switch at Auto state;
2	Attendant Run		1. Door auto open at stop; 2. Door close at close button pushed; 3. Car call auto register/ cancel wrong call; 4. Landing call stop car in same direction;	1. Turn all inspection switch to normal state; 2. Turn Auto/Attendant switch to Attendant state; 3. The other two Auto/Inspection switch at Auto state;
3	Inspection Run	Used at System Commissioning ; Maintenance	When push up/down button in inspection mode, car runs up/down at inspection speed. Car stop once button released.	Auto/Inspection switch at car top, car and control cabinet, priority from high to low.
4	Auto door open at power on	Auto door open	If car at leveling zone at power on, door open automatically.	
5	Auto door close in delay time	Door keep opening	After door complete opened, it keeps open and will auto close after delay time.	1. Delay time is set through open door holding time parameter (T) 2.T-2s with only landing call 3. T+2s with both landing call and car call.
6	Door OP at current floor landing call	Door open for landing call	If landing call on the same floor at door closing or door closed but car not running, door will open automatically.	Delay time is set by open door holding time.
7	Safety Plate/ light curtain	Close door safely	If safety plate touched/light curtain covered, door will open and close again.	Door safety plate/light curtain reset, door automatically close again.
8	Overload door keep open	Wait for load reduction	Door open at overload, with overload light on, buzzer sounds, CZ display on COP. Car not running.	Elevator back to normal state when overload is cleared.

Cart 2.18 Basic Function List (Cont'd)

No.	Name	Purpose	Description	Note
9	Full-load drive by pass	Run to nearest registered floor	At full load, car only respond to car call, not to landing call.	Elevator back to normal state when overload is cleared.
10	Attendant control by pass	VIP Run	At attendant run, press pass over button, elevator only responds to car call.	
11	Operation mode display	Adjust/ Maintenance	Elevator Running mode, direction, floor, door mode, load and fault information display on integrated controller LCD.	
12	Auto control light	Energy Saving	Car box light turned off if elevator is not used for 15 minutes. Turned on after receiving any call.	
13	Fire-Service Mode		System enters **fire-service mode** when fire switch is closed: 1. Clear up all landing/car call; 2. Auto return to fire floor 3. Door keep opens 4. Output fire linkage signal after return to fire floor. 5. If elevator runs in opposite direction, stop at nearest floor, do not open door, run directly to fire floor, door keep opens.	Two fire-service modes for option: **Fire mode 1:** Elevator stop running after returning to fire floor. **Fire mode 0:** a) Landing call disabled; b) Door keep opens at fire floor; c) To run elevator, fireman should first choose the target floor, press and hold the **close door** button till door close, elevator run; if **close door** button is released before door closed, door open again. d) Arriving target floor, press and hold **open door** button till door opens, otherwise door close again. e) Can only set one floor every running.
14	Auto stop at elevator fault	Free passengers	When car stop outside landing zone at elevator fault, it will auto crawl to leveling zone in middle floor direction and open door.	Only if safety circuit and inverter are both working normal.

Cart 2.18 Basic Function List (Cont'd)

No.	Name	Purpose	Description	Note
15	Parking	Stop Running	Elevator enters parking mode at electric lock closed. 1.Elevator does not respond to landing call, service all car call and return to parking floor (adjustable); 2. If no car call, elevator directly return to parking floor; 3. After return to parking floor: a. HOP and COP display parking sign "ZT"; b. Do not respond to car/landing call; c. After 10s, door close, car box light and HOP/COP display turn off. d. Press any COP/Open, close door button, car box light turns on; e. Press Open/Close door button, car door close again and cut car box light after 10s.	1. If elevator at inspection mode when close electric lock, car cannot auto return to parking floor. Other functions remain. 2. Integrated controller in working state when elevator at parking mode. Once open electric lock, elevator will run normally.

Chart 2.19 Special Function List

No.	Name	Purpose	Description	Note
1	Hoistway Learning	Measure, store hoistway data.	In inspection mode, from bottom terminal switch to top terminal switch, measure and store the landing zone and hoistway switch position.	Hoistway learning may be terminated in unusual condition and system will give error code accordingly. Please follow **Chart 8.2** for detail error codes. ▲**Note：** When hoistway learning stops, only when "**Success**" is displayed on the operator means hoistway learning success.
2	Double press Cancellation	Cancel car call	Press car call button again could cancel such call. (Button answer light off)	Such function is also achievable when elevator is not running.
3	Anti-mischief	Cancel car call at terminal	1. When elevator reaches terminal switch, clear all car call. 2. For elevator with weighing device, only last 3 car calls are registered at light load.	

Chart 2.19 Special Function List (Cont'd)

No.	Name	Purpose	Description	Note
4	Landing call button stuck diagnose	Repair indication	If one landing call button is pressed for more than 20s, it is considered stuck (cannot reset), such call is not registered, button answer light flashes.	Exit such state when button is reset.
5	Repeat close door		At close door command, if door interlock circuit not connected in set time, door open and close again.	If repeat 5 times and door interlock circuit still not close, elevator stops for service, display error code accordingly.
6	Machine room floor selection	Maintenance	Use hand operator to input car call	
7	Machine room floor open/close door	Maintenance	Use hand operator to input open/close door command	
8	Non-Stop Floor		User can set any floor not to stop	
9	Homing floor set	Wait at homing floor	In auto mode, with no landing/car call for certain time, car goes to homing floor.	Can only set one homing floor.
10	Display character set	Change display of certain floor	Display character on any floor can be set through hand operator. (Character or Figure)	
11	Attendant Direction Set	VIP Mode	Choose elevator direction through up/down button before running	Only available in Attendant mode.
12	Auto Start/Stop Elevator Service	Automatic start/stop elevator service	User may set elevator on/off time by practical requirement.	1. Time is set by 24hrs 2. Cancel this function by setting both on/off time to 00. 3. This function is only available with electric lock open, otherwise elevator in parking mode. 4. To enable elevator service in off time: a. Close electric lock, wait for 1s, reopen electric lock to enter **force on** mode, elevator could use normally. b. Close electric lock after use, wait for 1s, reopen electric lock to exit **force on** mode, elevator in off time.

Chart 2.19 Special Function List (Cont'd)

No.	Name	Purpose	Description	Note
13	Special Running	Special Passenger Service	Landing call is invalid, elevator controlled by attendant. Door control mode is attendant mode.	Only available with special buttons.
14	Door open time delay set	Delay the door open time	Press this button before car door fully closed, door open time will be delayed to setting time.	1. Must have door open delay button 2. Only available in Auto Mode 3. Normally used in bed elevator system
15	Rear door control	Elevator with two doors	Control rear door operation on each floor	Follow section 6.8 for rear door mode setting.
16	Trouble Shooting	Automatic find and record fault data.	1. When fault happens, system diagnoses fault condition and display error code on LCD. 2. System record the last 30 fault data (fault time/class/floor) in error report menu for further reference.	For trouble shooting error code please follow **Chart 8.1** Trouble shooting for Elevator
17	Interference evaluation	Inspect site interference condition	Evaluate the site shielding condition, including control cabinet/hoistway connection to ground, help to increase resistance to interference.	This function is only available after elevator commissioning and testing.
18	Encoder Evaluation	Inspect encoder output signal	Analyze the evaluate encoder output signal, help service team onsite maintenance to eliminate elevator shock and leveling issue.	Provide direct evidence on encoder quality and interference condition.
19	Input port evaluation	Inspect input signal interference	System evaluates and displays the input signal quality, help service team to increase the hoistway cable resistance to interference and eliminate elevator COP/HOP display fault information and leveling issue.	Provide direct evidence on input signal interference.

Chart 2.19 Special Function List (Cont'd)

No.	Name	Purpose	Description	Note
20	Emergency Auto Leveling (ARD mode)	After power cut, elevator powered by emergency leveling device, level to nearby landing zone.	After power cut, elevator powered by emergency leveling device and level to nearby landing zone to free the passenger. Such function must meet certain requirements: 1. After power cut, elevator powered by emergency leveling device. (integrated controller I/O board terminal X18 enable); 2. Elevator NOT in inspection mode; 3. Elevator NOT at landing zone; 4. Elevator can run normally; 5. Safety/Door inter-lock circuit close; Elevator emergency leveling procedures when not at landing zone: 1. Determine run direction based on load condition (need weighing device); 2. After leveling to nearby floor, door keep open, and emergency leveling device cuts off power. 3. After power recovery, if system record a history of emergency leveling action, elevator return to bottom floor to re-calibrate hoistway data. **When at landing zone**, emergency leveling device supply power, elevator door open (integrated controller I/O board terminal X18 must enable).	Because the power of emergency automatic leveling running is supplied by elevator emergency automatic leveling controller device, drawings of controller system is different from standard drawing. When you need this function, please ask technique department for drawings accordingly.

Chart 2.20 Main safety protection Function

No.	Name	Elevator Description
1	Safety Circuit	Safety circuit open, entire system stops immediately.
2	Door interlock	Elevator can only run with all door interlock closed, otherwise entire system stops immediately.
3	Operation Contactor	System check operation contactor constantly, if found any abnormality, system stop immediately.
4	Brake checking protection	The detection switch of brake arm makes a real-time inspection of opening/closing of the brake. If the brake fails to open as per requirements, the system will prevent the elevator from start.
5	Terminal speed-change&correct floor display	If the elevator detects a terminal switch during running, it will be forced to decelerate and meanwhile automatically correct the floor display.
6	Position-limit protection	If the elevator detects a limit switch, the entire system stops immediately.
7	Limit protection	If the elevator runs to trigger a limit switch, he entire system stops immediately.

Chart 2.20 Main safety protection Function(Cont'd)

No.	Name	Elevator Description
8	Safety Circuit	Safety circuit open, entire system stops immediately.
9	Door interlock	Elevator can only run with all door interlock closed, otherwise entire system stops immediately.
10	Operation Contactor	System check operation contactor constantly, if found any abnormality, system stop immediately.
11	Brake checking protection	The detection switch of brake arm makes a real-time inspection of opening/closing of the brake. If the brake fails to open as per requirements, the system will prevent the elevator from start.
12	Terminal speed-change&correct floor display	If the elevator detects a terminal switch during running, it will be forced to decelerate and meanwhile automatically correct the floor display.
13	Position-limit protection	If the elevator detects a limit switch, the entire system stops immediately.
14	Limit protection	If the elevator runs to trigger a limit switch, he entire system stops immediately.
15	Instantaneous over-current protection	If detects over 200% rated output current system stops immediately.
16	Fuse blowing protection	When fuse blow, the entire system stops immediately.
17	Overload protection	If detects over 150%/180% rated current, system will stop after 60s/10S.
18	Over-voltage protection	Main DC bus voltage higher than 780V, system(400V) will stop or main DC bus voltage higher than 410V, system(200V) will stop
19	Under-voltage protection	Main DC bus voltage lower than 380V, system(400V) stop or main DC bus voltage lower than 190V, system(200V) will stop.
20	Radiator overheated protection	Thermal resistor protection.
21	IGBT interior protection	IGBT over current、overheated、short circuit、under-voltage protection.
22	Electric motor protection	Electric thermal protection.
23	Impact restrain loop failure protection	Through contactor joint to feedback protection.
24	Over speed protection	Protect when the speed is faster than allowed.
25	Over deviation protection	Protect when speed deviation is larger than allowed.
26	PG fault protection	Protect when PG braking or phase stagger.
27	Self-study protection	Protect when self-study of motor parameter unusual.
28	Phase lack protection	Protect when lack of in/output phase.
29	Door drive signal	Protect when door signal unusual.
30	Running time protection	Protect when once run time is longer than limited time.
31	Counter of floor protection	Protect when floor counter is wrong.
32	Trouble of communication immunity	Protect when communicate interrupt.
33	Hoistway learning error	Protect when have trouble in hoistway learning.

Chart 2.21 Optional Function List

No.	Name	Elevator Description
1	Remote Monitoring	Monitor elevator running status in monitor current through wire/wireless network.
2	Arrival Gong	Clock announce.
3	Voice Synthesizer	Voice announce.
4	Identity Control	ID/IC Car control.
5	Weighing device	Weighing device for elevator.

Chapter 3 Wiring

This chapter describes the terminals and wiring specifications for main circuit, control circuit and PG card of the integrated controller.

This chapter introduces the wiring and installation of cabinet. Facing with different type of environment, customer need to select suitable cabinet and wire installation according to site condition. The debugging should be done by qualified person with professional training.

3.1. Cautions of wiring

1）Prepare all external cable before connection start.

2）Ensure the diameter and compressive strength of power cable can meet the related requirement.

3）To avoid wire mixing or isolation damage, input and output cable must be separately used.；

4）TO avoid Signal interference, power cable must be separately wiring, analog signal must use shielded twisted wires, shielded wire must connect to reliable earth.

5）Don't forget short wires in cabinet, it may cause danger.

Before measuring isolation resistor of transformer or testing power frequency, the cable between mainboard and interface board must be disconnected, otherwise it may cause unit damage.

3.2. External ports of cabinet

This section mainly introduces external ports. Please read manual carefully and complete external cable connection according to cabinet diagram. Before wiring, please complete preparation work according to this section.

Cabinet external port includes main circuit terminal, control circuit terminal, cabinet interface board, earth wiring and terminal of PG card and motor encoder.

3.2.1 Terminal of control signals

Main circuit use bolt to fix, which ensure the reliability of wiring, Following part introduces main circuit.

Figure 3.2, N、L1、L2、L3 are input port of cabinet power.B1 and B2 are terminal for braking resistor.、U3、 V3、 W3 are output of cabinet.

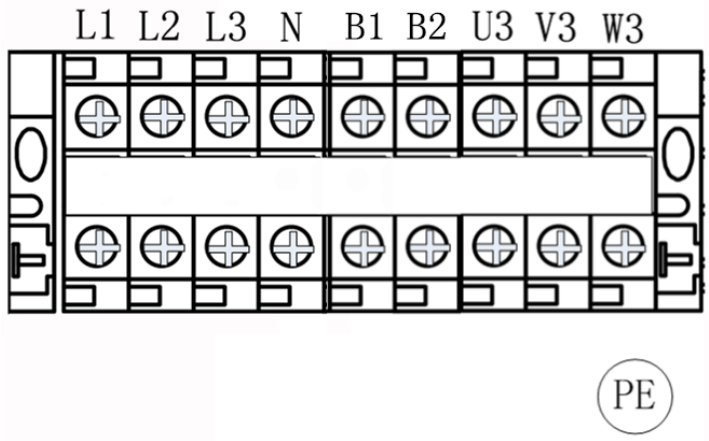


Figure 3.1 Main circuit terminal

Chart 3.1 Main circuit terminal

Label	function
（N）、L1、L2、L3	3-Phase input power, N is neutral
B1、B2	Connect to braking resistor
U3、V3、W3	Cabinet output terminal, connect to motor

Note 1: When install, please notice main circuit phase and input/output cable are correct or not, Otherwise, cabinet cannot work normally.

Note 2: When wiring, please make sure N wire is connected to cabinet, otherwise cabinet cannot work normally.

3.2.2 Terminal of control signals

Besides main circuit terminal, cabinet uses interface board to connect signal wires to avoid interference. These two parts of cable must be isolated. Control signal terminals are all on interface board. There're no extra signals.

3.2.3 HMIO-TV1 interface board of control cabinet

HMIO-BV1 interface board supplied fixed port for customer, making it easy for wiring. Using integrated cabinet from us, only external cable is needed. Customer may make cable according to our diagram as well.

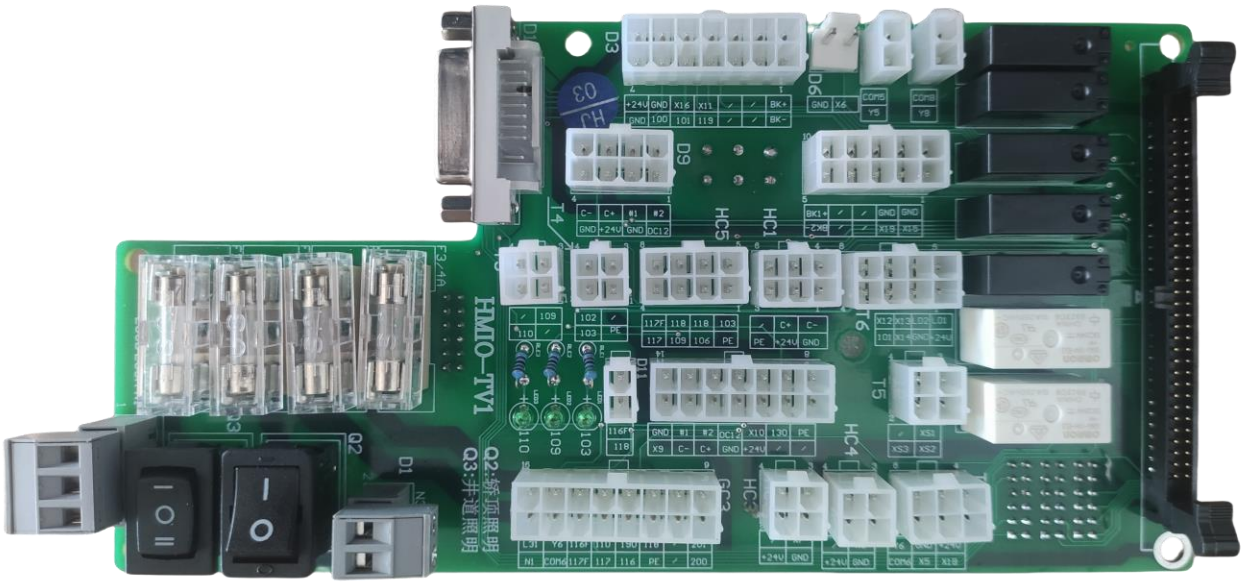


Figure 3.2 HMIO-TV1 interface board

Figure 3.2 Port definition of interface board

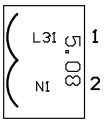
Plug	Port	Signal	function
D1		D1-1 L31	Lamp power input L（to traveling cable）
		D1-2 N11	Lamp power input N（to traveling cable）

Figure 3.2 Port definition of interface board (Cont'd)

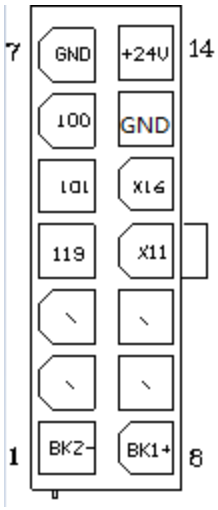
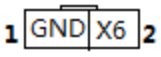
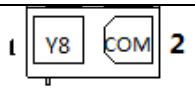
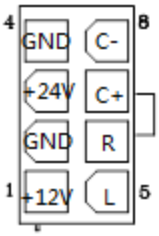
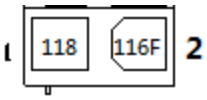
Plug	Port	Signal	function
D3		D3-1 BK2-	DC110V-（Brake power board output）
		D3-2 -	Null
		D3-3 -	Null
		D3-4 119	Brake control
		D3-5 101	Safety circuit power-（24V）
		D3-6 100	Safety circuit power+（24V）
		D3-7 GND	Control system power GND
		D3-8 BK1+	DC110V+（Brake power board output）
		D3-9 -	Null
		D3-10 -	Null
		D3-11 X11	Brake test 1
		D3-12 X16	Brake test 2
		D3-13 GND	Brake test COM GND
		D3-14 +24V	Control system power 24V
D5		D5-1 Y5	Y5 Spare output
		D5-2 COM	Y5 output COM
D6		D6-1 GND	Main contactor feedback COM
		D5-2 X6	Main contactor feedback input
D8		D8-1 Y8	Brake control output2
		D8-2 COM	Brake control output2 COM
D9		D9-1 +12V	Intercom DC12V power
		D9-2 GND	Intercom GND（0V）
		D9-3 +24V	DC +24Voutput（to car top）
		D9-4 GND	DC 0Voutput（to car top\DC12 GND）
		D9-5 L	Intercom #2（to machine room）
		D9-6 R	Intercom #1（to machine room）
		D9-7 C+	CAN communication CANH
		D9-8 C-	CAN communication CANL
D11		D11-1 118	Middle point of front door and rear door in through door mode（short rear door when single door）
		D11-2 116F	Rear car door（Short wiring when single door）

Figure 3.3 Introduction of interface board----machine room

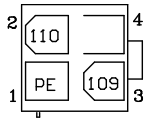
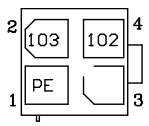
Plug	Port	Signal	function
T3		T3-1 PE	PE
		T3-2 110	Speed governor-（Safety circuit）
		T3-3 109	Speed governor+（Safety circuit）
		T3-4 Null	Null
T4		T4-1 PE	PE
		T4-2 103	Hand wheel-（Safety circuit）
		T4-3 Null	Null
		T4-4 102	Hand wheel+（Safety circuit）

Figure 3.3 Introduction of interface board----machine room (Cont'd)

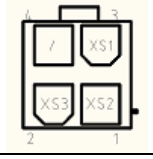
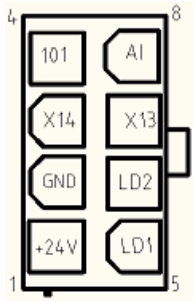
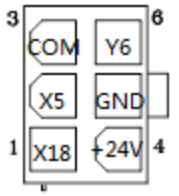
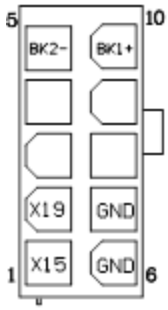
Plug	Port	Signal	function
T5		T5-1 XS2	Speed governor reset
		T5-2 XS3	Speed governor remote testing（GND）
		T5-3 XS1	Speed governor test
		T5-4 /	Null
T6		T6-1 +24V	Spare output
		T6-2 GND	Spare output
		T6-3 X14	Spare input
		T6-4 101	Spare output
		T6-5 LD1	Firelinkage
		T6-6 LD2	Firelinkage
		T6-7 X13	Thermal switch monitoring/ multi-function input
		T6-8 AI	Spare input
T7		T7-1 X18	Spare input
		T7-2 X5	Spare input
		T7-3 COM	Y6 Spare output COM
		T7-4 +24V	Spare output
		T7-5 GND	Spare output
		T7-6 Y6	Y6 Spare output
D7		D7-1 X15	Left brake arm feedback 1
		D7-2 X19	Right brake arm feedback 2
		D7-3 Null	Null
		D7-4 Null	Null
		D7-5 BK2-	DC110V-（to Brake coil）
		D7-6 GND	input（feedback）Signal GND
		D7-7 GND	input（feedback）Signal GND
		D7-8 Null	Null
		D7-9 Null	Null
		D7-10 BK1+	DC110V+（to Brake coi）

Figure 3.4 Interface board port introduction--traveling cable

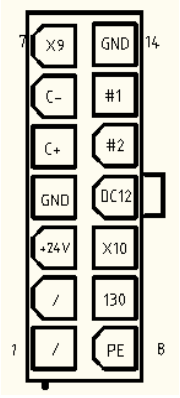
Plug	Port	Signal	function
GC2		GC2-1 -	Null
		GC2-2 -	Null
		GC2-3 +24V	DC +24Vinput（car top and car power）
		GC2-4 GND	DC 0Vinput （car top and car power \inter GND）
		GC2-5 C+	CAN communication CANH
		GC2-6 C-	CAN communication CANL
		GC2-7 X9	Up safety door zone Input Signal
		GC2-8 PE	PE
		GC2-9 130	Car top inspection
		GC2-10 X10	Down safety door zone Input Signal
		GC2-11 DC12	Intercom power DC +12Voutput（back to machine room）
		GC2-12 #2	Car intercom #2
		GC2-13 #1	Car intercom #1
		GC2-14 GND	DC 0Vinput （car top and car power \inter GND）

Figure 3.4 Interface board port introduction--traveling cable (Cont'd)

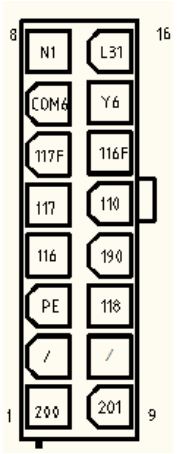
Plug	Port	Signal	function
GC3		GC3-1 200	Door controller power input AC 220V-L
		GC3-2 Null	Null
		GC3-3 PE	PE
		GC3-4 116	Safety circuit（start point of car top safety and car door circuit）
		GC3-5 117	Front hall door and car door shorting point
		GC3-6 117F	Rear hall door and car door shorting point
		GC3-7 COM	Y6 COM
		GC3-8 N1	Car top lamp power output(AC 220V-N)
		GC3-9 201	Door controller power output AC 220V-N
		GC3-10 Null	Null
		GC3-11 118	Middle point between front door and rear door
		GC3-12 190	Safety circuit
		GC3-13 110	Safety circuit (safety gear)
		GC3-14 116F	Safety circuit（car door return point）
		GC3-15 Y6	Y6 Spare output
		GC3-16 L31	Car top lamp power input (AC 220V-L)

Figure 3.5 Interface board port introduction--shaft cable

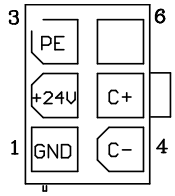
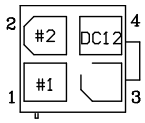
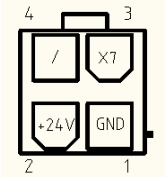
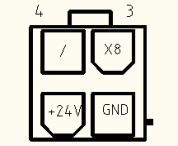
Plug	Port	Signal	function
HC1		HC1-1 GND	DC 0Voutput （for LOP）
		HC1-2 +24V	DC +24Voutput （for LOP）
		HC1-3 PE	PE
		HC1-4 C-	CAN communication CANL
		HC1-5 C+	CAN communication CANH
		HC1-6 Null	Null
HC2		HC2-1 #1	Pit intercom #1
		HC2-2 #2	Pit intercom #2
		HC2-3 Null	Null（***Note： Intercom power 0V is got from HC1-1**）
		HC2-4 DC12	Pit intercom Power DC +12Voutput
HC3		HC3-1 GND	Input Signal GND
		HC3-2 +24V	DC +24V output
		HC3-3 X7	Top terminal 1
		HC3-4 -	Null
HC4		HC4-1 GND	Input Signal GND
		HC4-2 +24V	DC +24V output
		HC4-3 X8	Bottom terminal 1
		HC4-4 -	Null

Figure 3.5 Interface board port introduction--shaft cable (Cont'd)

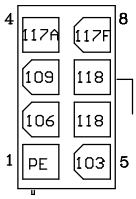
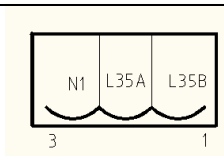
Plug	Port	Signal	function
HC5		HC5-1 PE	PE
		HC5-2 106	Safety circuit（Short when emergency running）
		HC5-3 109	Safety circuit（Short when emergency running）
		HC5-4 117A	Safety circuit（start point of front hall door）
		HC5-5 103	Safety circuit（Pit safety return point）
		HC5-6 118	Safety circuit（Front hall door end point）
		HC5-7 118	Safety circuit（Rear hall door start point）
		HC5-8 117F	Safety circuit（Rear hall door end point）
HC7		HC7-1 L35B	Shaft lamp power
		HC7-2 L35A	Shaft lamp power
		HC7-3 N1	Shaft lamp power

Figure 3.6 Interface board port introduction--others

Plug	Port	Signal	function
JTTR1		64P（2.54）	To MU_V61 VC1 board（64P）
F1，F2		CQ-200PT	6A/250V（5*20mm）lamp power fuse
F3，F4		CQ-200PT	4A/250V（5*20mm）door motor fuse
Q2	Lamp power switch		
Q3	Shaft lamp power switch		
D1	Operation box cable		

3.2.4 Grounding terminal

NS05 series villa lift control cabinet has grounding terminal. An unified grounding wiring position is reserved at left bottom of terminal bar. To make cabinet shield to have same electromotive force with earth wire of power grid, to guarantee people safety and to prevent to get an indirect electric shock NS05, please connect the exposed and conductive part of device to ground.

While connecting, please put the grounding wire through the hole of connector, then use cross screw driver to fix it on terminal bar.

Note1: Customer needs to select suitable grounding wire according to the manual;

Note2: Make label for grounding wire and ensure there's damaged part or short circuit with other wires;

Note3: When connecting grounding wire, make sure the power is turned off;

Note4: After connecting grounding wire, please check carefully and confirm the bolt is fixed well to avoid the electric leakage danger.

3.2.5 Connection between PG card and motor encoder

PG card is connected to integrated controller JPGR connection through JEN connector, and is fixed by nylon screw on main board. Through the connection between JG1 terminal and encoder, it forms speed close-loop vector system. (Detail information is in chapter 2.6.6)

Note： The encoder cable of our company uses the bottom outlet hole, which is used for control signals, to avoid electromagnetic signal interference. Customer needs to follow the operation manual.

3.3. Introduction of main electric circuit

This section mainly introduce main schematic diagram of NS05 cabinet. When customer do wiring or use, the content and diagram can be taken as reference to ensure it works normally.

3.3.1 Elevator main circuit

To meet leakage current protection requirement in GB7588.1, leakage current detection function need to be added in safety circuit, refers to diagram 3.5.

Note1: Main circuit should be 3-phase 5 wires type. Power box need to configured 4 linkage breaker which can cut off 3-phase and neutral. And 3-phase 5 wires must enter elevator system, otherwise, system cannot work.

Note2: Cabinet has built-in Car lamp linkage protection, leakage protection, shaft lamp and double control switch, to supply leakage protection for car light, shaft light.

3.3.2 Safety circuit and door circuit

NS05 series villa lift cabinet Safety circuit diagram is shown in figure 3.6.

The main control board is controller mainboard, this board has 4 safety circuit detection points（X29、X30、X31、X32）. They are used for detection of safety circuit, door circuit and two door adhesion detection. Safety circuit is powered by brake power board in cabinet, voltage is 24VDC.When following conditions occur, Safety circuit will be cut off.

1）Cabinet STOP button is pressed.

2）In elevator system, electric switches of safety component cut off when elevator starts. Only when 4 high voltage input are normal, (safety circuit and door circuit are both normal), elevator can work normally.

3.3.3 Inspection circuit

NS05 series villa lift cabinet inspection circuit is shown in following drawing：

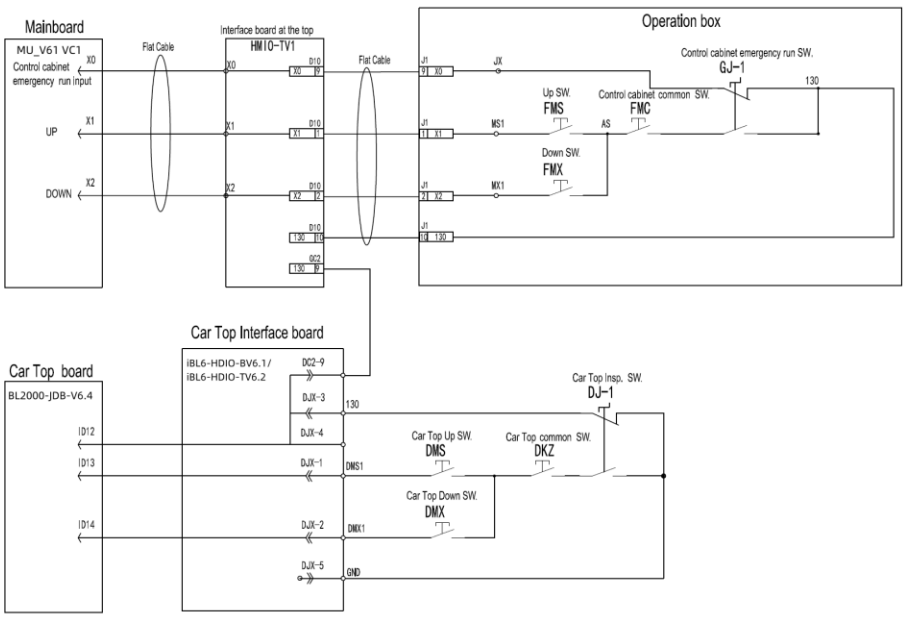


Figure 3.3 Inspection circuit diagram

By switching cabinet emergency running switch or car top inspection switch, elevator can enter to inspection mode. After operating car top inspection switch, ID12 on car top board inspection signal will be valid. Meanwhile, inspection switch will cut off inspection circuit. Only when operating car top inspection button and direction button, it will connect safety circuit and make elevator move in inspection mode. In the same way, after operating cabinet emergency running switch, only cabinet up and down button are permitted. Car top inspection can ensure car top inspection has higher priority than cabinet emergency running through cutting off inspection circuit.

3.3.4 Brake circuit

NS05 series villa lift cabinet brake circuit is shown in following drawing.

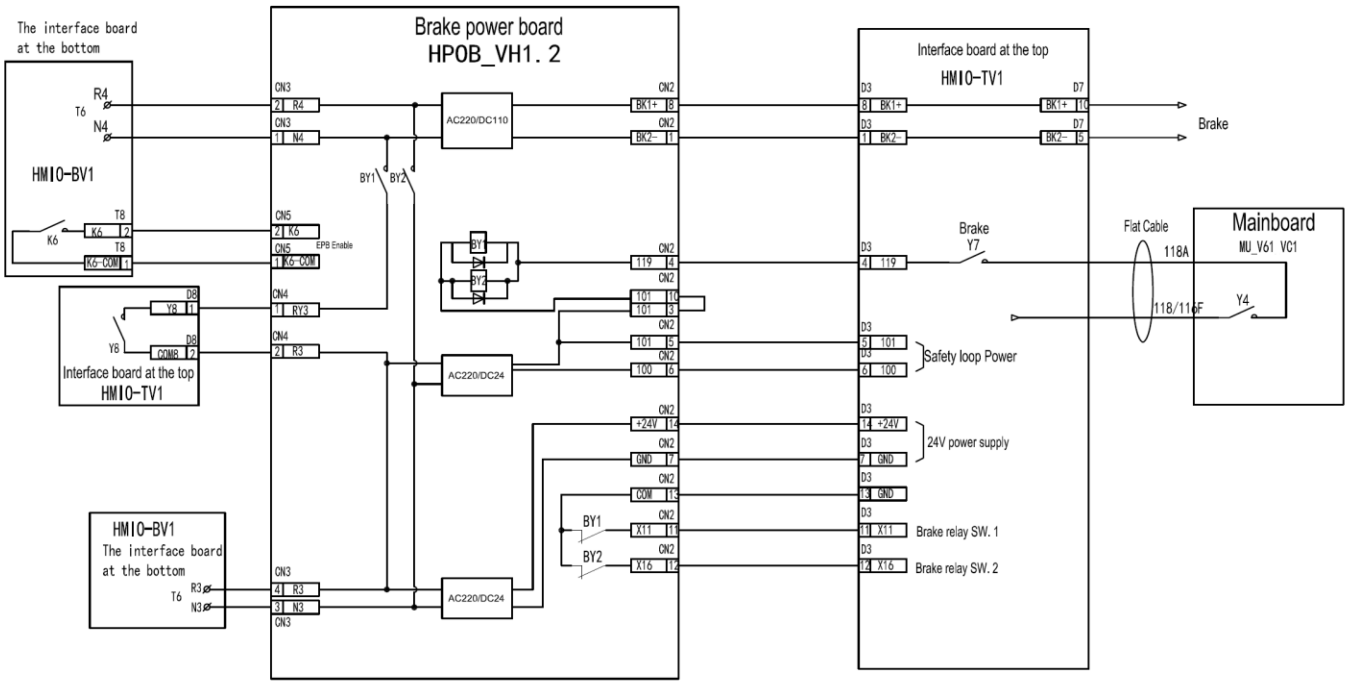


Figure 3.4 Brake circuit diagram

Note 1： Motor brake power output port is on interface board （ D7Plug）；

Note 2： This brake circuit can only be used for standard DC brake circuit.

3.4. System wiring diagram

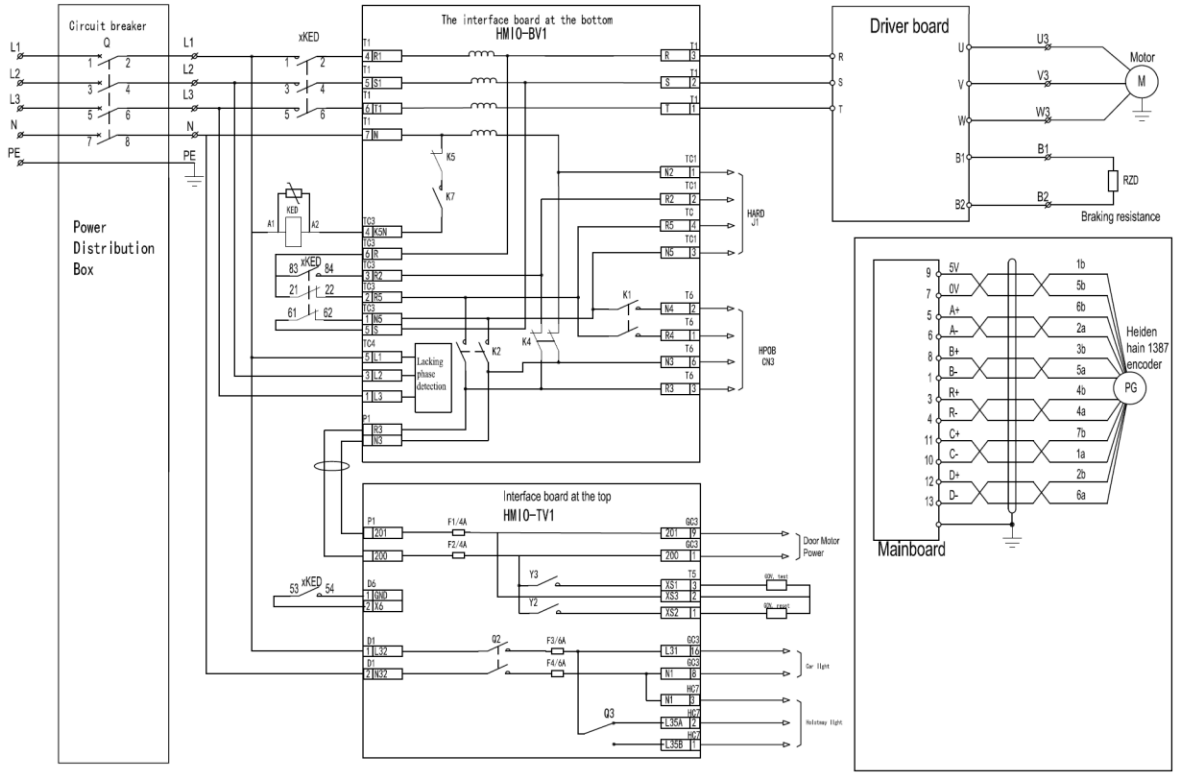


Figure 3.5 Main circuit diagram

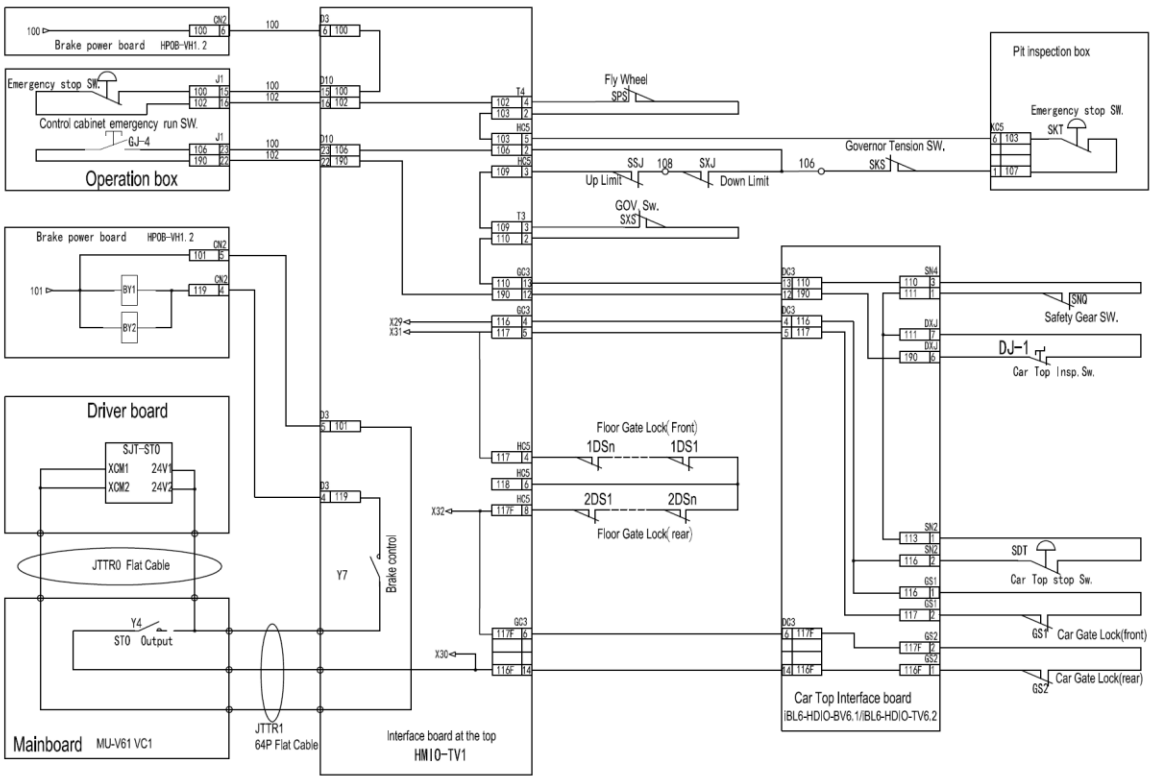


Figure 3.6 Safety circuit diagram

3.5. Precautions with Wiring

1. Before connection, please pay attention to the precautions mentioned in chapter 1.2, especially the “warning” and “caution” part.

2. Before connection， make sure that the power supply is off, and the charge indicator LED is out.

3. Please ask professional engineers with training and authorization for the wiring.

4. The wire size and clamping torque should follow the regulation of Chart 3.2 and chart 3.4

5. To increase wiring convenience and reliability， it is better to use round crimp type terminal (for main circuit) and club-shaped terminal (for control circuit).

6. Wire the control circuit/main circuit/power supply separately.

7. CAN communication cable、encoder cable、encoder frequency output cable and analog input cable should use TWISTED-PAIR SHIELD CABLE.

8. Please ground the cable shield wire correctly and maximize the contact area.

9. Make sure the signal cable for PG/encoder is less than 30m in length, and as short as possible.

10. Make sure the cable between controller and machine is less than100m, and as short as possible.

11. Make sure the brake resistor is connected between B1 and B2.

12. Make sure the connection of ground terminal PE is secure, do not share the ground cable with other devices such as welding machines or power tools. Minimize length and dimension of ground cable and ground at one point.

13. After wiring, make sure check the following:

1) Correctness and reliability of connection.

2) Whether there is leftover, such as wire, screw and metal filing

3) Whether the connection of the screw, the terminals and the connection parts are loose.

4) Whether the bare conductor of terminals is connected with other terminals.

Chapter 4 Digital Operator

NS05 series villa lift control cabinet is equipped with LCD digital operator OP-V6. It is a tool for commissioning and maintenance of control system. It provides a nice and easy human-machine interface with both Chinese and English on display.

4.1. Key, display and function of Digital Operator

The digital operator OP-V6 has the main LCD screen with resolution of 128×64 LCD, 5 LED and 11 function buttons. Refer to Figure 4.1 below for detail.

FIGURE 4.1 DIGITAL OPERATOR

4.1.1 Operator LED Display

LEDs on the top of the operator display controller current state simply and directly. The definition and display function of each LED, as shown in chart 4.1.

Chart 4.1 LED definition & display function

Name	Function
DRV	When the controller is in operation, the led light.
FWD	When the controller is in forward running operation, the led light.
REV	When the controller is in reversal running operation, the led light.
COM	When the controller communication is normal, the led light.
ERR	When the controller is in fault, the led light.

4.1.2 Operator Keys

Chart 4.2 Operator Keys names and functions

Keys	Name	Function Description
	[RUN] Key	Run the controller in keypad control mode; button is disabled in program control mode. Enable/disable is set through parameters.
	[STOP] Key	Stop the controller in keypad control mode; button is disabled in program control mode. Enable/disable is set through parameters.
	[MENU] Key	Return to main menu on any screen.
	[SHIFT] key	Enable the 2nd function of other keys.
	[RESET] Key	Enter the digit setting option for certain parameters.
	[UP] Key	Scroll up menu options or edit figures in certain setting page.
	[DOWN] Key	Scroll down menu options or edit figures in certain setting page.
	[LEFT] Key	For parameter setting, choose the left digit for editing.
	[RIGHT] Key	For parameter setting, choose the right digit for editing.
	[ENTER] Key	Enter the next level sub-menu on main screen; Input set value on parameter setting; Give command; Check fault/warning information.
	[ESC] Key	Return the previous level menu.

4.1.3 LCD Display

Controller enters the main interface after power on. The main interface is shown in Figure 4.2.

The main interface displays the main information of the elevator in present status, including floor number, elevator speed, running direction, door lock status, running model, fault code and else. On the main interface, the above information is live updated.

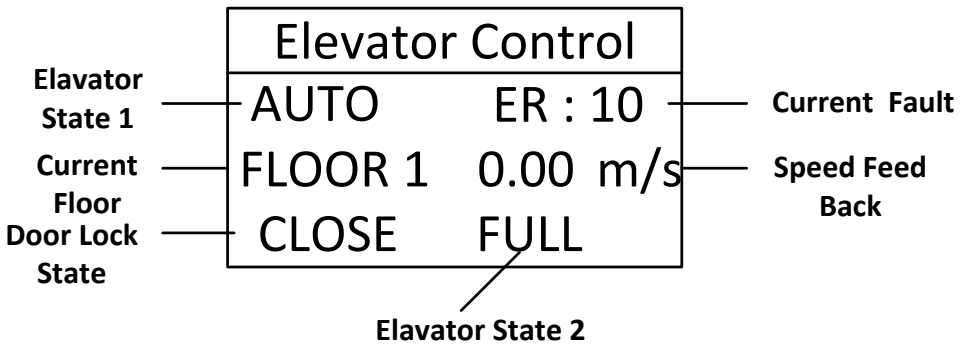


FIGURE 4.2 MAIN INTERFACE ON DIGITAL OPERATOR

The instructions for the information shown in the Digital operator LCD display interface are as following:

1. The status of the elevator display1：

INSP ARD MANU AUTO
FIRE STOP USER

2. Present floor display:

Display the floor number that the elevator is at.

3. Door lock status:

CLOSE/OPEN: Door inter-lock circuit closed/opened.

4. The status of the elevator displays 2:

FULL: Full load
OVER: Overload
GROUP: Group control
TWINS: Duplex control

5. Present error:

ERR：XX Display the present Error code.

4.1.4 Function of Operator

The function of digital operator is as follows:

1. LCD display with English and Chinese
2. Setting log in level and corresponded password.
3. Adjusting the settings of quick menu
4. Monitor the status of the elevator and the controller.
5. Parameter check, setting and save.
6. Hoistway learning
7. Motor parameter learning
8. Weighing data learning
9. System clock setting
10. Error history log record and check.
11. Parameter copy, upload and download.
12. Restore to factory setting.

4.1.5 Installation and Connection of Digital Operation

The connection for the digital operator of the opening controller is as follows: remove the front cover of the controller, connect one side of the special communication cable to digital operator, and connect the other side to the J232_T connection on the main board. Make sure the connection is securely; install the front cover of the controller.

1. The installation, dismantle, insert and remove of the digital operator can be carried out when the controller is power-on. That is to say, hot plug is accepted by the digital controller.

2. Please install, dismantle, insert and remove the digital operator carefully to avoid unwanted damage of the digital operator.

3. Please save the removed digital operator and communication cable well, DO NOT press, damage the operator or put it in extreme environment.

4. Please DO NOT use the self-made (> 3m) communication cable.

4.2. Structure and Switch process of the Operator Interface

The structure and interface switch process of the digital operator, as shown in Figure 4.3.

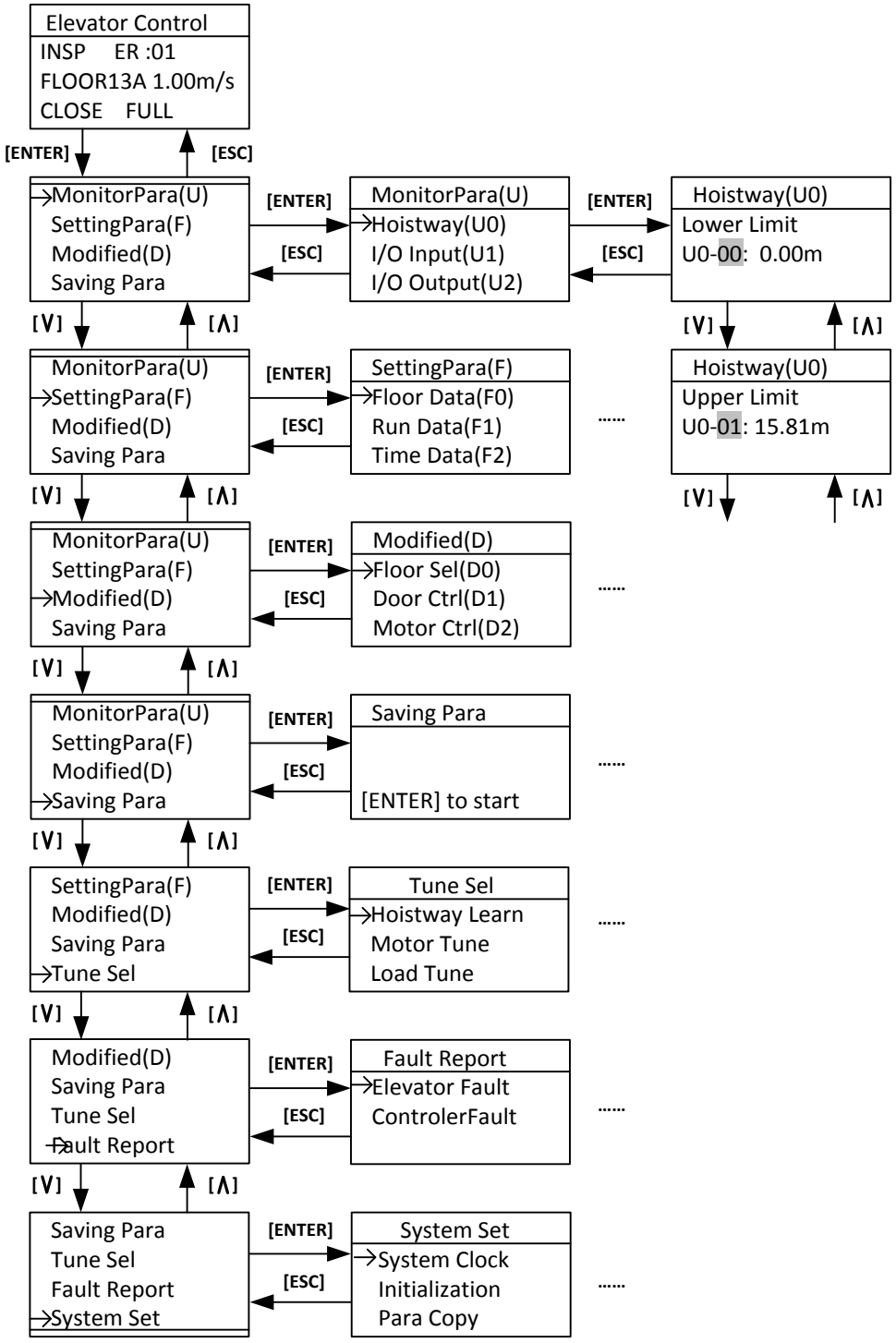


FIGURE 4.3 STRUCTURE FLOWCHART OF OPERATOR MENU

4.3. Parameter Setting

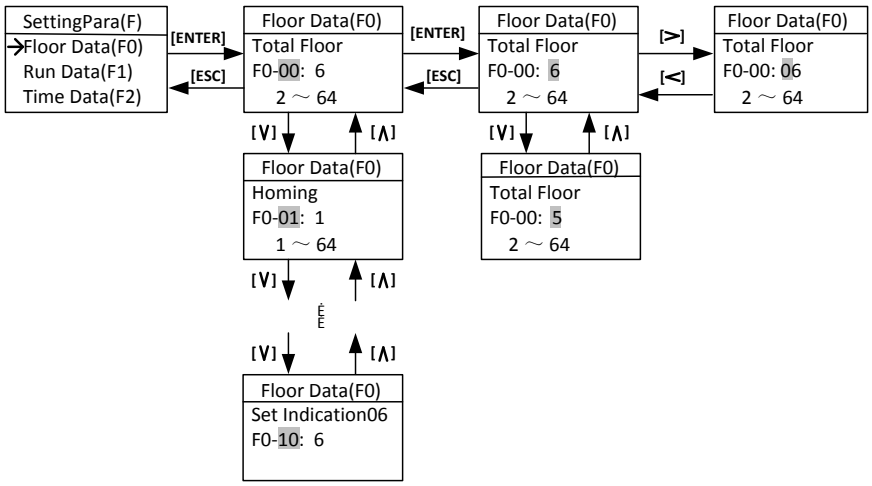


FIGURE 4.4 PARAMETER SETTING

In the interface of parameter menu: Press [ENTER] key to enter the interface. (First, it should input the correct user password in the environment setting menu, otherwise, pressing the [ENTER] key will enter the interface of user password setting. So please pay attention to distinguish the factory password and user password. If you want to input the factory password, please press the [ESC] key, returning to previous menu, then press the [DOWN] key to change the prompt to "input the factory password", after that press the [ENTER] key, entering to the interface of the inputting factory password). Press the [UP] or [DOWN] key to check all the parameters. Please press the [ENTER] key to enter the interface of parameter menu. Please press [LEFT] or [RIGHT] key to move the arrow to left or right. Press the [UP] or [DOWN] to increase or decrease the value that the arrow point at. After setting the value, please press the [ENTER] key to save the parameter.

Some parameter values are combination values of the status. Their setting cannot follow the above flowchart directly and should follow the ToolTip in the parameter changing interface. Press [RES] key to enter the bit parameter setting interface to set the status value as per the bit. After entering the bit parameter setting interface, press [UP] or [DOWN] key to check the status of the present bit. When the status of the present bit needs to be changed, press [ENTER] key to enter the status change interface. In the status change interface, press [UP] or [DOWN] key to check the status of the present bit, press the [ENTER] key to save the status of the present bit, press [ESC] key to return the Previous Menu

The process of bit parameter setting is shown in Figure 4.5.

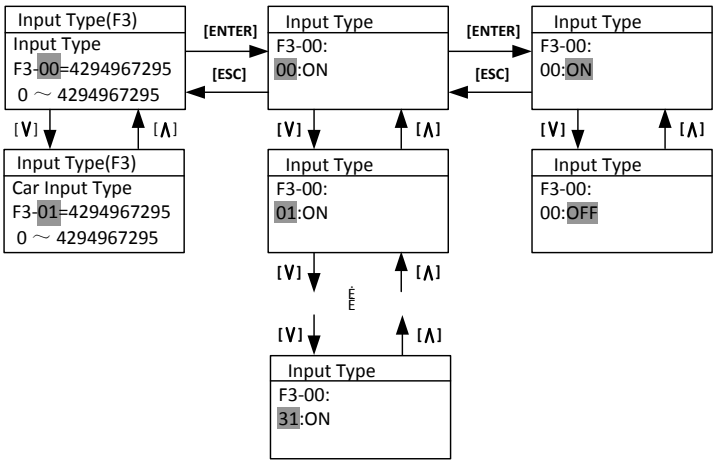


FIGURE 4.5 SETTING BIT PARAMETERS

4.4. Commissioning Parameters

In commissioning interface: Move the arrow by pressing [UP] key or [DOWN] key to carry out the operation, press [ENTER] to enter the selected interface.

In floor selection interface: Press [UP] key or [DOWN] key to check the car call status in present floor. If need to set car calls on current floor, press [ENTER] key in the interface to save the car call information. In the interface, the information follows “F:” is the present floor the elevator car at.

Floor selection flowchart is shown in Figure 4.6.

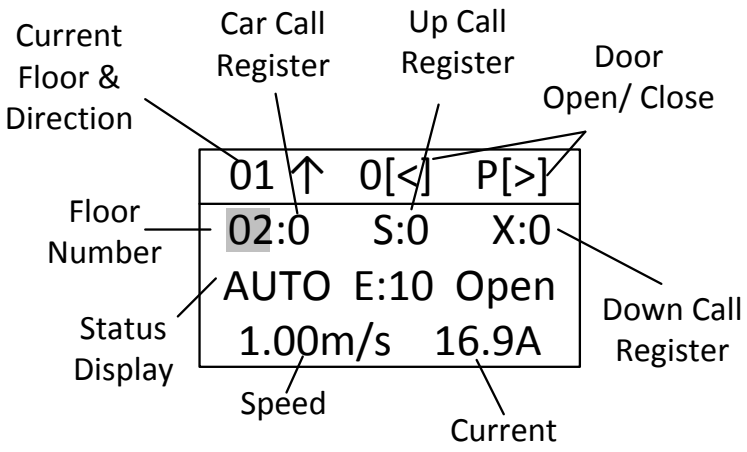


FIGURE 4.6 FLOOR SELECTION

In the interface of door control: Press [LEFT] key in the interface to carry out the command “opening front door”. Press [RIGHT] key to carry out the command “close front door”. Press [UP] key to carry out the command “open rear door”. Press [DOWN] key to carry out the command “close rear door”, Press [RES] key to cancel all the commands.

Door open and close flowchart is shown in Figure 4.7.

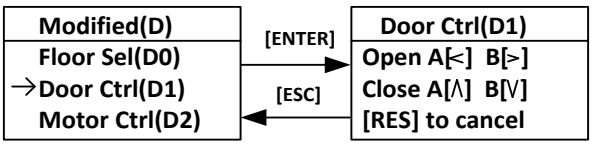


FIGURE 4.7 DOOR CONTROL INTERFACE

In Motor Control interface: Press [UP]/ [DOWN] key to select the running mode is continuous running or JOG. In continuous running mode, press [RUN] key to start motor first, press [UP]/ [DOWN] key to increase/decrease the motor given speed. The motor given speed can be negative (negative speed means motor reverse run), press [ENTER] key to save the given speed. Press [STOP] key to stop the motor. In the mode of JOG, press [UP]/ [DOWN] key to increase/decrease the JOG operation frequency, after press the [ENTER] to save the setting, and then press the [RUN] key to start and press the [STOP] to stop the operation.

The process of operator to control the motor running is shown below in the Figure 4.8.

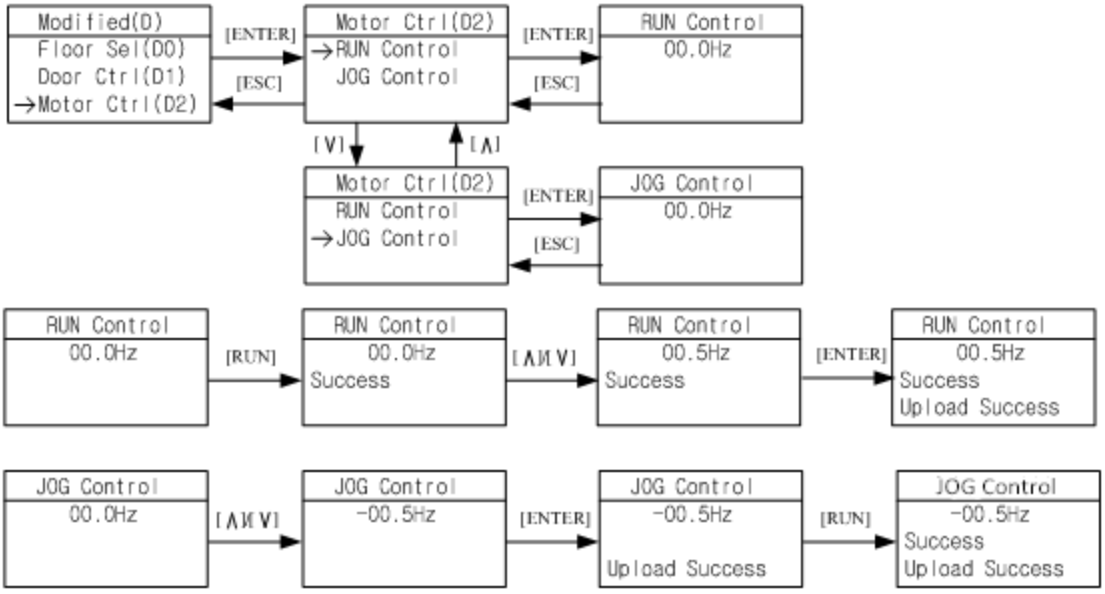


FIGURE 4.8 FLOWCHART FOR OPERATOR TO CONTROL MOTOR RUNNING

In interface of call testing: Press [UP]/ [DOWN] key to check the connections for all floors. Normally, it displays running success, otherwise it shows fails. Press [ESC] key to return to the Previous Menu.

The flowchart for call testing is shown in Figure 4.9.

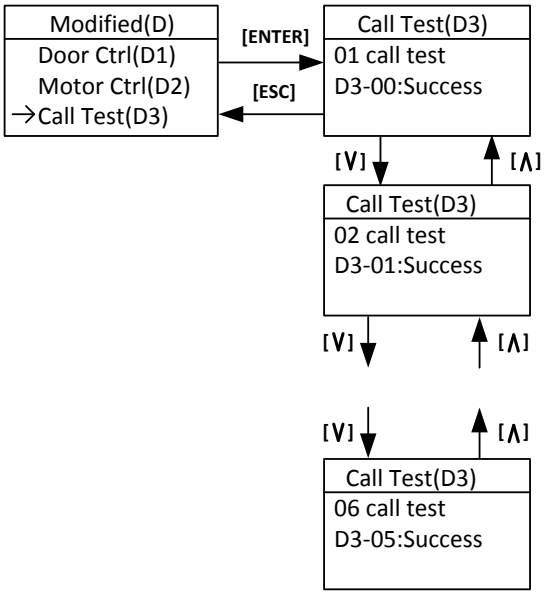


FIGURE 4.9 ELEVATOR CALL TESTING INTERFACE

The interface of communication testing is shown in the Figure 4.10.

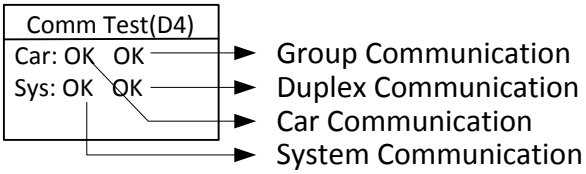


FIGURE 4.10 COMMUNICATION TESTING INTERFACE

The display of the Car Control Communication is as follows:

OK Communication normal

ER Controller receiving data error (please check communication connection & car control board), when there appears a numerical value, it refers to the times of error on car control board communication.

System communication display

OK communication good

ET the controller sending data error (please check landing call communication connection), when there appears a figure, it refers to the times of error on system communication.

Group control communication

OK Group control system communication normal

ER Group control system communication abnormal (When choose this option)

Duplex control communication

OK Duplex control system communication good

ET/ER Duplex control system communication abnormal (When choose this option)

4.5. Save Parameter

In the interface of saving parameter, press the [ENTER] to save all the parameters in the F menu. During saving process, LCD will display “Waiting”; after saving, it will display “Success” or “Failure”. The flowchart of saving parameter is shown in the Figure 4.11.

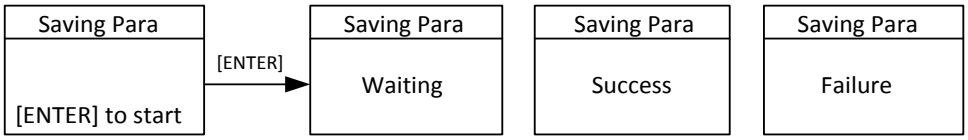


FIGURE 4.11 SAVING PARAMETER

4.6. Hoistway Learning

4.6.1 For controller program of early version

In hoistway learning interface: when status display “To Down limit”, the hoistway learning cannot start directly. The elevator should manual run to the down limit position first, and “To Down limit” status disappear, the screen will display “[ENTER] to start”, press the [ENTER] key to start hoistway learning. During the learning process, the interface will display the current learning floor and display the status of “Waiting”, when the hoistway learning is completed, the status will display “Success”, when there are errors during the hoistway learning, the status will display “ERR” and display error code. Press [ESC] key to return the Previous Menu.

The flowchart of the hoistway learning is shown in the Figure 4.12.

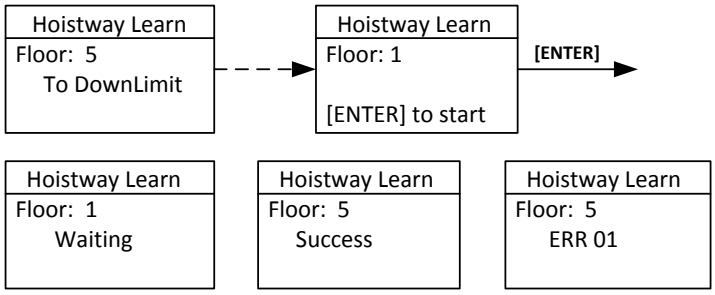


FIGURE 4.12 HOISTWAY LEARNING

4.6.1 For controller program of new version

In new version, hoistway learning can be started at any position. After hoistway learning start, elevator will return to bottom limit and stop for 10 seconds, then automatically run upward until top limit to complete hoistway learning.

4.7. Motor Auto-tuning

Motor Auto-tuning includes two parts: Motor angle tuning and motor parameter tuning. In the interface of Motor Tune: Press [UP] or [DOWN] key to move the arrow to select related tuning information; Press [ENTER] key to enter the pointed tuning interface.

In the interface of Motor Angle Tuning and Motor Parameter Tuning, press [ENTER] to start turning. During tuning, the operator displays "waiting"; after tuning, it will display "success". During tuning, if there is error, the tuning process will be terminated, and LCD will display "Tune End", and the status is "error", with error code followed.

IMPORTANT

Before auto-tuning process, make sure to set the parameters in the F5 & F8 menu first.

Make sure motor has no load, first carry out motor parameter tuning, then carry out the motor angle tuning. Press [ESC] key to return to the previous menu. The flowchart of the motor learning is shown in Figure 4.13.

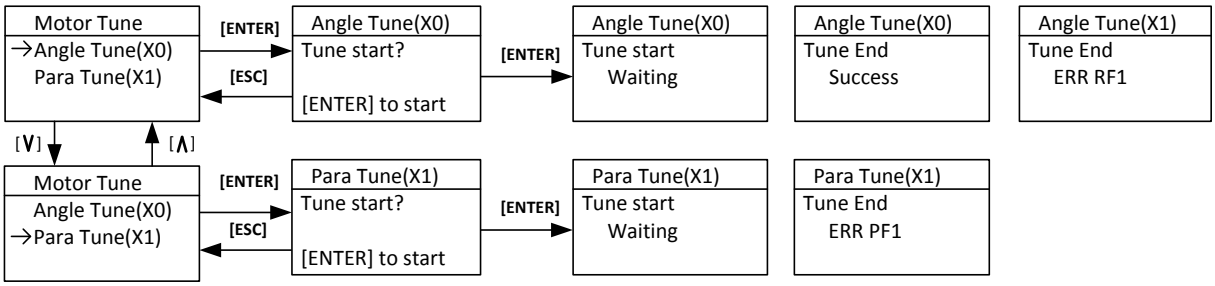


FIGURE 4.13 MOTOR AUTO-TUNING PROCESS

4.8. Motor Load Tuning

Motor Load Tuning also includes two parts: Light loaded tuning and Full-loaded tuning.

In the interface of load tuning: Press [UP] or [DOWN] move the arrow to select related tuning information; press [ENTER] key to enter the pointed tuning interface.

In light-loaded tuning or full-loaded tuning interface: Press [ENTER] to start tuning process, the operator displays the present status. Press [ESC] key to return to the Previous Menu.

The load tuning process is shown in Figure 4.14.

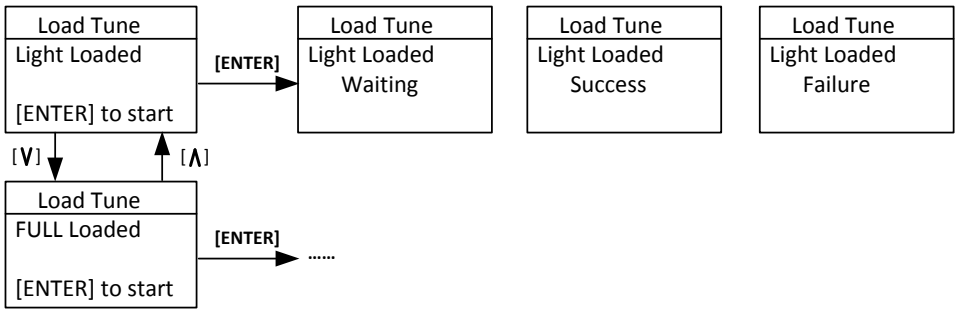


FIGURE 4.14 MOTOR LOAD TUNING PROCESS

4.9. Time Setting

In the interface of time setting, the last two digits of "Year", "month", "day", "hour", "Minute" and "second" are editable, press [LEFT] or [RIGHT] to move the arrow to the right place. Press [UP] or [DOWN] key to change the pointed value. After setting: Press the [ENTER] key to save. Press [ESC] key to return the Previous Menu.

The flowchart of time setting is shown in the Figure 4.15.

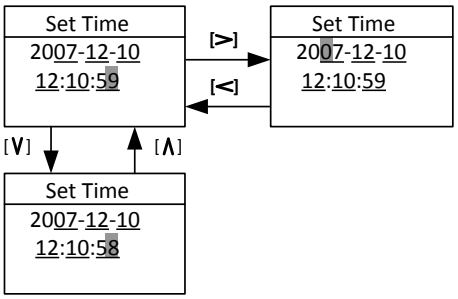


FIGURE 4.15 TIME SETTING

4.10. Fault Record Check

In the interface of Fault Record: Press [UP] or [DOWN] key to check the elevator and controller fault record. Press [ENTER] to enter the selected fault record, press [UP] or [DOWN] key to check the latest 30 fault history record.

Each elevator fault record includes error code, time, elevator status at fault (Floor number, running direction, running speed, I/O state), and related information. This helps to find the root cause of the elevator fault and guide the elevator maintenance.

Each controller fault record includes error code, time, elevator status at fault and other important data (Running speed, line/BUS voltage and current). This helps to find the root cause of the controller fault and guide the elevator maintenance.

The flowchart of the fault record check is shown in the Figure 4.16.

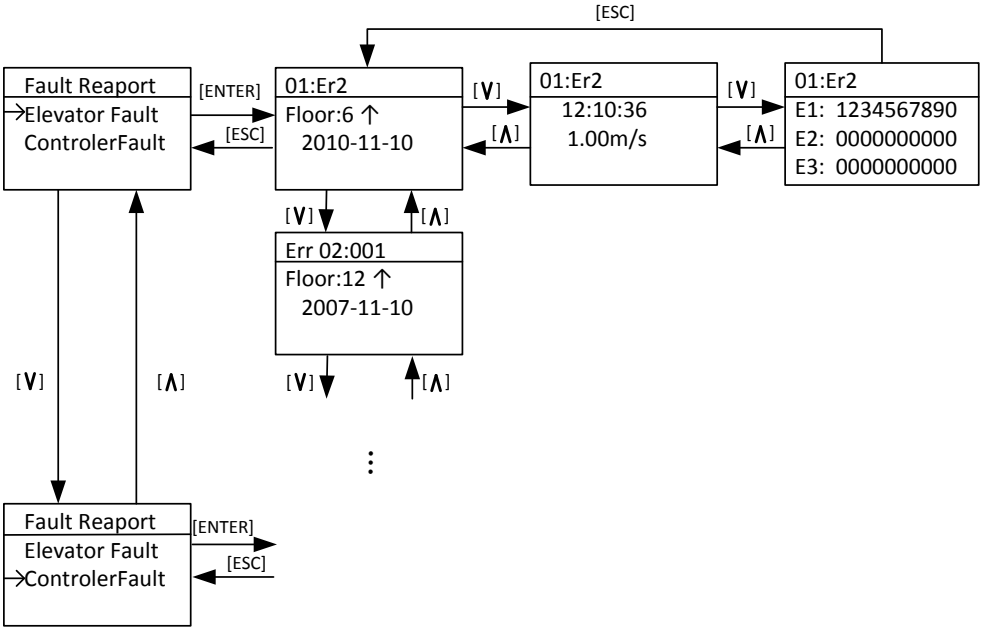


FIGURE 4.16 FAULT RECORD

Press [ESC] key to return to the Previous Menu.

4.11. Environment Initialization

In environment initialization interface, the display language, the parameter visit grade, input password and the shortcut menu of the operator can be set.

The flowchart for environment initialization is shown in the Figure 4.17.

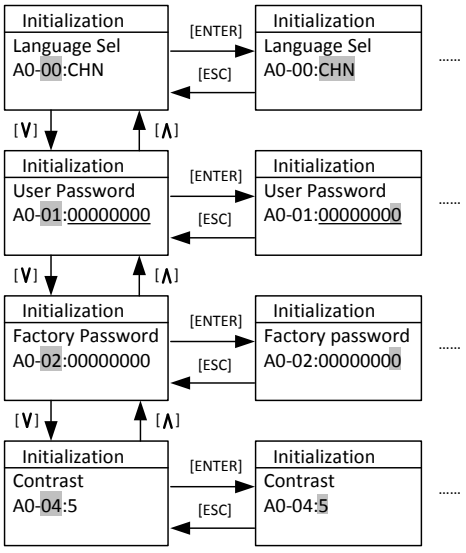


FIGURE 4.17 ENVIRONMENT INITIALIZATION

Language Selection

The flowchart for the language selection is shown in the Figure 4.18.

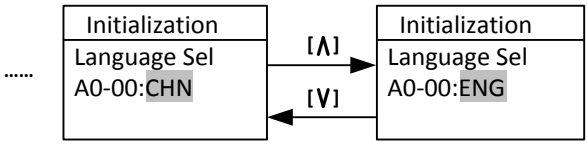


FIGURE 4.18 LANGUAGE SELECTION

Press [UP] or [DOWN] to select language, and press [ENTER] key to save the selection.

User password input and setting

In the interface of password, press the [LEFT] or [RIGHT] key to move the arrow to the pointed position, press [UP] or [DOWN] key to increase or decrease the pointed value, press the [ENTER] key to input the password. When password input is incorrect, “invalid password” will be displayed, and the password cannot be changed at this time. When the password input is correct, “Password OK” will be displayed, next press [ENTER] first then press [RES] key to enter the password setting interface and reset the password. Resetting password is similar to input password. Finally press the [ENTER] key to save the new password.

The flowchart of the password input and change is shown in the Figure 4.19.

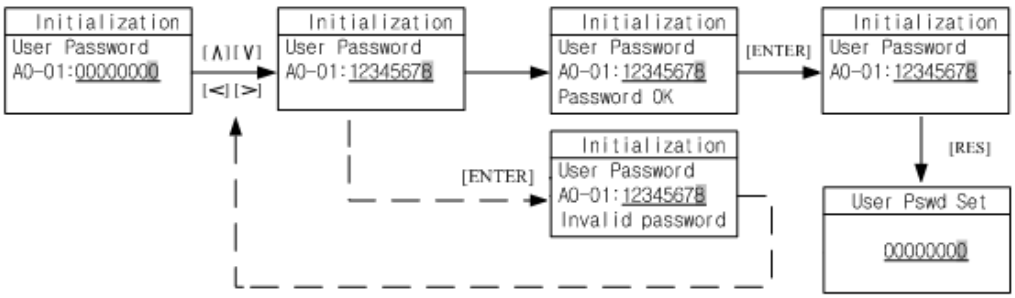


FIGURE 4.19 USER LEVEL PASSWORD INPUT/CHANGE

Factory levelpassword Input and Setting

The process of the factory level password input and setting refers to the user level password input and setting.

Function shortcut keys

For the convenience of function switching, the following sets of function shortcut keys have been set:

1. Switching between Chinese and English modes: On the initial interface of the operator when powered on (i.e. the main interface), press the SHIFT button without releasing it, then press the MENU button without releasing it, wait for 1 second, and Chinese and English will switch;

2. LCD screen contrast adjustment: At the initial interface (i.e. main interface) when the operator is powered on, press and hold the RES button, wait for 1 second, and the brightness of the LCD screen will change;

3. Program version number and font version view: In the initial interface (i.e. the main interface) when the operator is powered on, press the SHIFT button without releasing it, then press the RES button without releasing it, wait for 2 seconds, and the program version number and font version will be displayed.

4.12. Parameter Copy

The function parameter copy is to simplify the parameter setting and commissioning process, especially for multiple elevators with same configurations. After finishing the parameter setting and commissioning of one elevator, this function can copy all the parameters (Saved in the digital operator memory), take the digital operator and connect to other elevators, copy all the parameters to the controller, check parameters, and the elevator can run normally.

In the interface of parameter copy: Press [UP] or [DOWN] key to move the arrow to carry on the necessary operation, press the [ENTER] key to start operation.

The flowchart of parameter copy is shown in Figure 4.20.

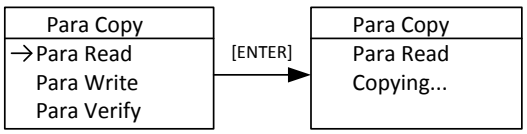


FIGURE 4.20 PARAMETER COPY

After copy operation, LCD display is shown below in Figure 4.21.

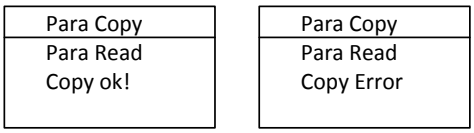


FIGURE 4.21 PARAMETER COPY FINISH

Press [ESC] key to return to the previous menu.

4.13. Restore to Factory Setting

If necessary, the controller can be restored to the factory (default) setting. Press the [ENTER] key to restore the factory setting, the interface will display the status and the result.

The flowchart of restore the factory setting is shown in the Figure 4.22.

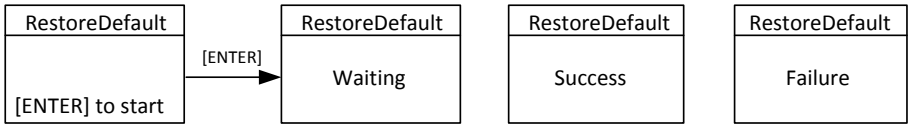


FIGURE 4.22 RESTORE TO FACTORY SETTING

Press [ESC] key to return the previous menu.

4.14. Blue-Light Traction machine Parameter Input

When using Blue-Light Integrated Controller, if the traction machine is also made by Blue-Light, you only need to input the machine model number and encoder information on the machine name plate to finish the parameter setting of the machine.

The interface of the Blue-Light machine input is showing in Figure 4.23(a). The input content has three parts, separated by ".". The first part is the model number (separated in 4 digits), the middle part is encoder resolution information, the last part is the PG model. The detail information is showing in Figure 4.23(b).

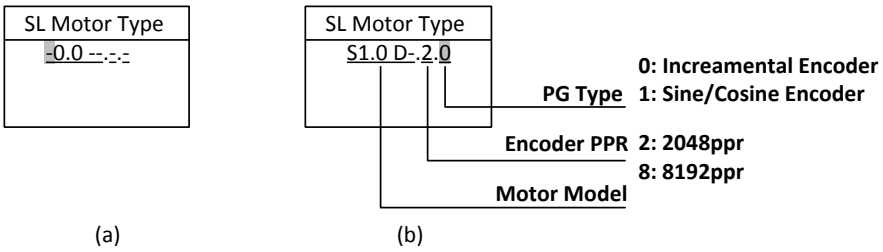


FIGURE 4.23 BLUE-LIGHT MACHINE INPUT

Use [UP] or [DOWN] key to set the content of the pointed area, then press the [ENTER] key to confirm. The cursor is then moved to next bit. If the pointed area is not set, the cursor will not move even you press the [ENTER] key (Except the 4th number of the machine model, e.g. S1.0D- as the last number is empty, you can press the [ENTER] key directly to set the next bit).

The flow chart of the Blue-Light machine input is shown below in Figure 4.24 (S0.75D as an example).

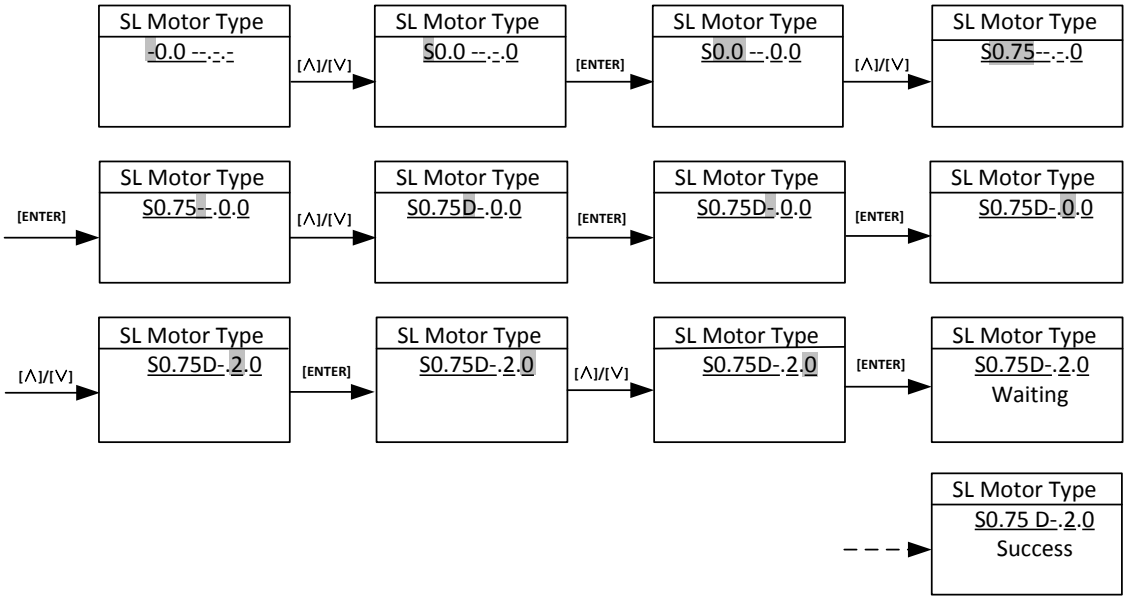


FIGURE 4.24 BLUE-LIGHT MACHINE INPUT FLOW CHART

Chapter 5 Parameters

5.1. Parameters Function Classifications

According different function, parameters are divided into groups as shown in chart 5.1.

Chart 5.1 Parameter Functions List

Function Symbol	Function Name
U	Monitoring Parameters
F	Setup Parameters
A	Environment Initialization
D	Commissioning Parameters

5.2. Parameters Hierarchical Structure

The hierarchy structure of parameters as shown in Figure 5.1.

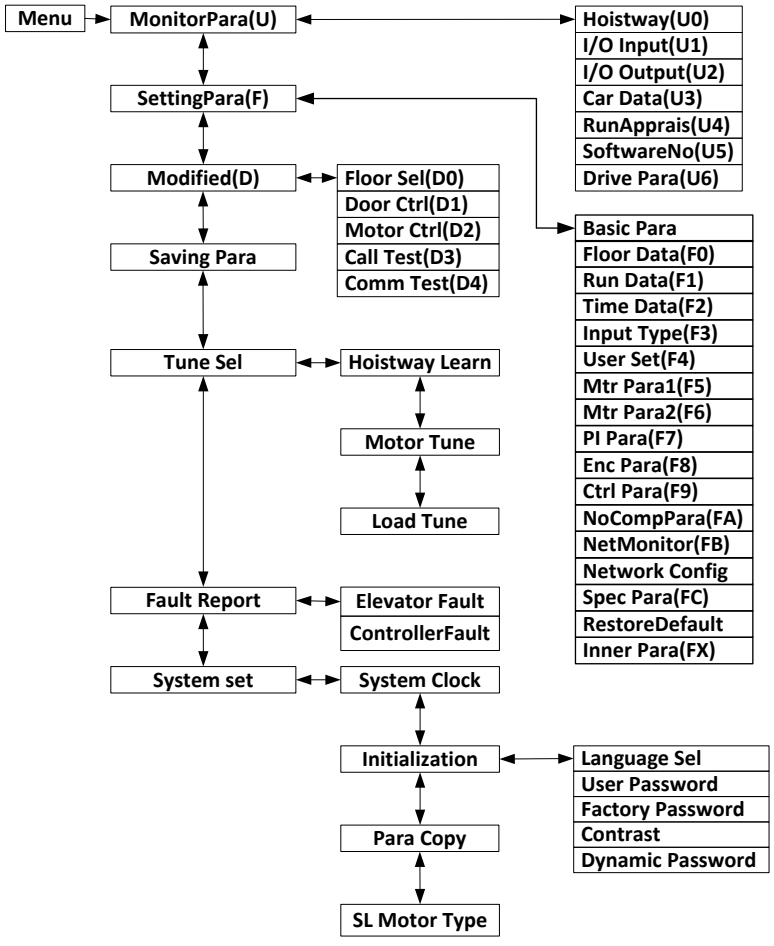


FIGURE 5.1 CONTROLLER PARAMETERS HIERARCHICAL STRUCTURE

5.3. Monitoring Parameters

5.3.1 Hoistway Location (U0)

Hoistway location parameters refer to the hoistway switches (top/bottom terminal/limit switches) position data on each floor recorded in the controller after hoistway learning process, and the unit is m (meter). If need to calculate the distance between two floors, simply minus the calibration data on these two floors.

After hoistway learning, please check the floor calibration, if the calibration value is higher than expected, it is possible that elevator's rated speed setup is higher than the actual value or elevator encoder pulse setup is smaller than the actual pulse. If the calibration value is too low, it is possible that elevator rated speed setup is lower than the actual value or its encoder pulse setup is larger than the actual pulse.

Hoistway location parameter's number, description and content are shown in chart 5.2

Chart 5.2 U0 Monitoring Parameter List

Para No.	Display	Content	Range	Unit	Ref Page
U0-00	Lower Limit	The location of bottom limit in hoistway. Data will be recorded after finishing hoistway learning	--	m	--
U0-01	Upper Limit	The location of top limit in hoistway. Data will be recorded after finishing hoistway learning。	--	m	--
U0-02	Lower Slowdown 1	Location of bottom terminal switch 1in hoistway. Data will be recorded after finishing hoistway learning	--	m	--
U0-03	Lower Slowdown 2	Location of bottom terminal switch 2in hoistway. Data will be recorded after finishing hoistway learning	--	m	--
U0-04	Upper Slowdown 1	Location of top terminal switch 1in hoistway. Data will be recorded after finishing hoistway learning	--	m	--
U0-05	Upper Slowdown 2	Location of top terminal switch 2in hoistway. Data will be recorded after finishing hoistway learning	--	m	--
U0-06 … U0-69	Floor Data 1…64	The location of floor 1-64 switches in hoistway. Data will be recorded after finishing hoistway learning	--	m	--

5.3.2 Monitoring Parameter for I/O Status, Cabin Signal & Interference Appraisal (U1-U5)

Chart 5.3 U1~U5 Monitoring Parameter List

Para No.	Display	Content	Range	Unit	Ref Page
U1-00	Input Data	Controller input data show in decimal type. It will be turned into binary type to show the logical status of the input port.	--	--	29
U1-01	Input Bin	Input port data show in binary type. Each data corresponds to logical status of one input port.	--	--	
U1-02	Input App	Each line corresponds to one input port," On/Off" states the current port status, the following "n" value states the signal appraisal to input level. Value from "10" to "0" refers to interference condition from good (less interference) to bad (large interference)	--	--	
U2-00	Output Data	Display the output port Y0-Y15 current status. The valid output port has the corresponded indication. Port without output (invalid) will be hidden.	--	--	30
U3-00	Car Input Data	Display car input signal status. The valid input port has the corresponded indication. Port without input (invalid) will be hidden.	--	--	63
U4-00	Run Times	Show the elevator accumulated running times. Adopts 10 digital decimal figures as indication	--	Times	--
U4-01	Run Hours	Show the elevator accumulated running hour. Adopts 10 digital decimal figures as indication.	--	Hour	--
U4-06	Interfer Apprais	Appraise the value of interference strength at site. The big value refers to strong interference, "0" states no interference and good GND condition.	--	--	--
U4-07	Encoder Apprais	The interference degree of encoder signal. When elevator runs steady, large value states the encoder signal weak with heavy interference.	--	--	--
U4-09 ~ U4-19	Standby monitor	Standby monitor parameter	--	--	--

Chart 5.3 U1~U5 Monitoring Parameters List (Cont'd)

Para No.	Display	Content	Range	Unit	Ref Page
U5-00	CtrlSoftWare NO	Show the elevator control software information. Provide the current software version for factory maintenance and software upgrading.	--	--	--
U5-01	DriveCodeVer	Show the drive control software information. Provide the current software version for factory maintenance and software upgrading.	--	--	--
U5-02	CpldEdition	Show base drive control software information. Provide the current software version for factory maintenance and software upgrading.	--	--	--

For the meaning of input status U1-01 AND output status U2-00, please refer to the control terminal definition chart 3.3. (Page29)

Cabin signal symbol definition and content is shown in chart 5.4. (Page 63).

Chart 5.4 U3-00 Cabin Signal Content & Definition

Cabin signal	Symbol signal	Cabin terminal No.	Content
C00	IGM1	PC1-4	door close 1 input
C01	IKM1	PC1-5	door open 1 input
C02	IGM2	PC2-4	door close 2 input
C03	IKM2	PC2-5	door open 2 input
C04	GMV2	PC2-7	door close limit 2 input
C05	KMV2	PC2-8	door open limit 2 input
C06	GMV1	PC1-7	door close limit 1 input
C07	KMV1	PC1-8	door open limit 1 input
C08	SZY	J5-4（ZLB）	Special Use Input
C09	IGMYS	J3-4（ZLB）	door open delay input
C10	SZH	J5-2（ZLB）	Attendant input
C11	--	--	Empty (for Backup use)
C12	SZS	J6-2（ZLB）	Bypass drive input
C13	MZ	LW1-4	Full-load input
C14	QZ	LW2-4	Light-load input
C15	CZ	LW1-3	Over-load input
C16	KZ (50%)	LW2-3	50% Full-load (No-load) input
C17	KAB2	KAB2-10	Door safety plate 2
C18	KAB1	KAB1-10	Door safety plate 1
C19	ZHS	J4-2（ZLB）	Attendance direction up
C20	ZHX	J4-4（ZLB）	Attendance direction down
C21	LSB1	KAB1-12	New light curtain 1 input
C22	LSB2	KAB2-12	New light curtain 2 input
C23	SMQ	MQ2-3	Modular car top board communication Up door zone
C24	XMQ	MQ2-4	Modular car top board communication Down door zone

5.3.3 Drive Monitoring Parameters (U6)

Chart 5.5 U6 Drive Monitoring Parameters List

Para No.	Display	Content	Range	Unit	Ref Page
U6-00	Power	Rated power class	--	kW	--
U6-01	Ref Speed	Reference Speed	--	RPM	--
U6-02	Feedback Speed	Feedback Speed	--	RPM	--
U6-03	Load	The current load in % of full load	--	%	--
U6-04	DC Voltage	DC BUS voltage	--	V	--
U6-05	Output Current	Output Current	--	A	--
U6-06	Temperature	Drive internal temperature	--	˚C	--
U6-07	Output Torque	Output Torque	--	N·M	--

5.4. Parameters setup Function Instruction

5.4.1 Building Setup Parameters (F0)

Chart 5.6 Building Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F0-00	Total Floor	Total floor number (same as door zone plate number)	2~64	6	--	N	--
F0-01	Homing Floor	Without landing/car call elevator will return this floor.	1~Total floor	1	--	N	84
F0-02	Fire Floor	At fire-linkage circuit close, elevator enter fire mode and return to this floor automatically.	1~Total floor	1	--	N	85
F0-03	Parking Floor	When close electric lock in the process of running, elevator return to this floor and stop.	1~Total floor	1	--	N	84
F0-04	VIP Floor	VIP floor setup	1~Total floor	1	--	N	--
F0-05 ... F0-68	Set Indication 1~64	Set indication 1-64, customized character/figure display available	---	1 ... 64	--	N	91

IMPORTANT

"N" states the parameter cannot be changed in the process of running." Y" states the parameter can be changed in the process of running. It has same meaning in the following Chart.

5.4.2 Parameters for Running Setup (F1)

Chart 5.7 Running Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F1-00	Car Speed	Elevator speed at motor rated speed. Calculate through motor rated rev, traction ratio, deceleration ratio and traction sheave diameter.	0~4.0	0.5	m/s	N	76
F1-01	Motor Speed	Motor speed at elevator rated speed (Calculated)	1~ 9999	306	RPM	N	76
F1-03	Insp Speed	Car running speed at inspection cannot exceed 0.6m/s based on relevant standards and regulations	0~0.6	0.2	m/s	Y	76
F1-04	Start Speed	For large resistance at motor start, the starting speed can have smooth increase. The start smooth speed is invalid if set to "0".	0~0.2	0.01	m/s	Y	--
F1-05	Leveling Speed	When elevator park outside door zone due to fault, if satisfy running condition, the elevator can level to door zone with this speed.	0.01 ~ 0.6	0.2	m/s	Y	77
F1-06	Least Speed	Steady speed on the lowest speed curve.	0~1.0	0.3	m/s	N	77
F1-07	Open Door Speed	Car speed when elevator open door in advance is allowed.	0~0.3	0.15	m/s	N	Appendix 2
F1-08	Relevelst Speed	The speed limit for re-leveling. If speed exceeds such value in re-leveling process, the re-leveling will stop with #03 protections.	0~0.3	0.3	m/s	N	Appendix 2
F1-09	Relevelrun Speed	Elevator running speed at re-leveling.	0~0.10	0.05	m/s	N	Appendix 2

IMPORTANT

When elevator rated speed/Single floor running speed is lower than 0.5m/sec, please properly decrease the acceleration B1, deceleration B2; otherwise it will affect the system calculation of current speed. When user modifies the two speed values out of limit, system will reset to the data before modification.

Chart 5.7 Running Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F1-10	Acceleration B1	B1 refers to the acceleration speed curve changing rate, smaller value means elevator start with smooth and gentle increase of speed.	0.1~1.0	0.2	m/s^2	N	77
F1-11	Deceleration B2	B2 refers to the deceleration speed curve changing rate, smaller value means elevator brake with smooth and gentle decrease of speed.	0.1~1.0	0.2	m/s^2	N	77
F1-12	S Curve P1	P1: Acceleration speed increase rate at beginning of elevator start; smaller value means beginning of elevator start with slow and steady movement.	0.1~1.0	0.2	m/s^3	N	77
F1-13	S Curve P2	P2: Acceleration speed decrease rate at end of elevator start; smaller value means end of elevator start with slow and steady movement.	0.1~1.0	0.2	m/s^3	N	77
F1-14	S Curve P3	P3: Deceleration speed increase rate at beginning of elevator brake; smaller value means beginning of elevator brake with slow and steady movement.	0.1~1.0	0.2	m/s^3	N	77
F1-15	S Curve P4	P4: Deceleration speed decrease rate at end of elevator brake; smaller value means end of elevator brake with slow and steady movement.	0.1~1.0	0.2	m/s^3	N	77
F1-16	Zero Speed	Motor speed less than set value, system considers elevator speed as zero and output brake signal.	0~10	1	RPM	Y	81
F1-17	Leveling Adj	Adjust differences of up/down leveling	0~100	50	mm	N	91
F1-18	Load Adj	Normally used in synchronous machine system, compensate elevator load based on steel rope weight difference on each floor.	0~20	0	--	Y	90

IMPORTANT

Acceleration B1, deceleration B2, S curve P1, P2, P3, P4 work together to determine the final speed curve and its trend. These parameters have internal relation with each other and are not allowed to change at will. When the modified value is out of limit, the value will recover to the previous data.

Chart 5.7 Running Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F1-21	Drive Mode	Selection of driving mode, when setting "1", attendant/VIP mode close door manually; when setting "3", elevator automatically do test run, other value is invalid. When setting "4", enter the UCMP test mode, see **Appendix 10**; when setting "5" temporary shielding limit fault, run to up/bottom limit switch in inspection mode.	0~9	0	--	N	--
F1-22	Two Door Mode	Setup rear door mode, based on customer requirements, set from mode "0" to"5".	0~5	0	--	N	86/87
F1-23	Fire Mode	Three Fire modes: 1.Mode"0": Elevator run fire-mode after returning to fire floor; 2.Mode "1": Elevator stop running after returning to fire floor; 3. Mode "2": After elevator return to fire floor, depend on fire switch to run/stop in fire mode.	0~2	1	--	N	85
F1-24	Parallel No.	Set "YES" in duplex enable. Set elevator number 0-1 in duplex; 0-7 in group control.	0~7	0	--	N	89
F1-25	Twins Control	Elevator duplex control: 1: On 0: OFF	0/1	0	--	Y	89
F1-26	Group Control	Elevator group control: 1: ON 0: OFF	0/1	0	--	Y	90
F1-27	Far Monitor	Remote Monitoring System: 1：On 0：Off	0/1	1	--	Y	--
F1-28	Auto Parking	Auto parking: 1: ON 0: OFF	0/1	0	--	Y	84
F1-29	Load Enable	Load Weighing: 1: ON 0: OFF	0/1	0	--	Y	89
F1-30	Open Delay Able	Door open/close delay: 1: ON 0: OFF	0/1	0	--	Y	83
F1-31	Brake Feedback	Test brake feedback signal: 1: open 0: close	0/1	1	--	Y	79
F1-32	Spare code	Spare code input	0~9999	0	--	N	--

5.4.3 Time Setup Parameters (F2)

Chart 5.8 Time Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F2-00	Brake ON Time	Brake open first then run elevator speed curve. This is to improve the elevator start comfort and match control system with different machine brake on time.	0.00~9.99	1.00	s	Y	79
F2-01	Brake OFF Time	Brake close first then disable elevator run. This is to improve elevator stop comfort and avoid slip at elevator stop.	0.00~9.99	1.00	s	Y	79
F2-02	Insp Brake Time	The time delay in inspection mode before brake closes.	0.00~9.99	0.90	s	Y	79
F2-04	Zero Time	The time delay when system detects elevator stop. Adjust this parameter to close brake after elevator reach 0 speed completely, increase elevator stop comfort.	0~9.99	0.21	s	Y	80
F2-05	Open Door Time	In Auto mode, elevator automatically open door when stopping at one floor, door will automatically close after set time.	0~999	5	s	Y	82
F2-06	Open Delay Time	Enable door open delay function, press open delay button, door open time will be delayed.	0~999	60	s	Y	82
F2-07	Homing Time	The waiting time before elevator return to homing floor without landing/car call, set value to “0” to disable this function.	0~999	60	s	Y	84
F2-08	Door Run Time	1. Door open/close command run time; 2. Door open/close relay run time for door drive without open/close limit switch. 3. For door drive with open/close limit switch, this run time should be 1s longer than the door actual open/close time.	0~999	8	s	Y	83
F2-09	Beep Delay Time	After elevator change speed to target floor, landing signal is delayed by set time, arrival gong/voice synthesizers are also delayed by set time.	0.00~9.99	0.15	s	Y	--
F2-10	Enable Delay	Drive enable signal given/drop is delayed by set time after drive direction signal is given/drop. During this time, drive output current is decreased to reduce current noise.	0.00~9.99	0.80	s	Y	79

Chart 5.8 Time setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F2-11	Lamp Off Time	In Auto mode, if have no car/landing call during set time, system will cut car light power from COP.	0~999	15	min	Y	--
F2-12	Over Time	To prevent wire rope slipping or elevator car stuck, time from elevator running to stop is limited to set value. If elevator is running longer than set value, system stops immediately and enter protection mode. Need to re-start the system in order to exit from such mode.	0~999	45	s	Y	--
F2-13	SmoothStart Time	The time to keep elevator start smooth.	0.00~ 9.99	1	s	Y	79
F2-14 : F2-15	Start Time	System will automatically start the elevator (Electric lock: ON) at set time.	00:00 ... 23:59	00:00	Hour: minute	Y	84
F2-16 : F2-17	Stop Time	System will automatically stop the elevator (Electric lock: OFF) at set time. This function is disabled if same start/stop time.	00:00 ... 23:59	00:00	Hour: minute	Y	84
F2-18 : F2-19	Start Time1	When the time-sharing non-stop layer function is enabled (F4-07-20=ON), it is used as the starting time of non-stop layer period 1.	00:00 ... 23:59	00:00	Hour: minute	Y	
F2-20 : F2-21	Stop Time1	When the time-sharing non-stop layer function is enabled (F4-07-20=ON), it is used as the endding time of non-stop layer period 1.	00:00 ... 23:59	00:00	Hour: minute	Y	

The elevator automatic switch: F2-14, F2-15 F2-16, F2-17 were set separately as per hours and minutes. Please follow the operator indication for this setting.

5.4.4 Input type setup Parameters (F3)

Chart 5.9 Input Type Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Set	Ref Page
F3-00	Input Type	Setting the input type on main control panel. Each bit corresponds to one terminal. Set default level of mainboard input port. **ON:** Close enable, **OFF**: Open enable.	0 ~ 4294967295	4024434279	N	87/88
F3-01	Car Input Type	Setting the input type of cabin. Each bit corresponds to one terminal. **ON**: Close enable, **OFF**: Open enable.	0 ~ 4294967295	2147090191	N	88
F3-02	Input select 1	X13 Input Function Selection 0~19： X0~X19 23: Thermal switch 24: Light curtain	0~32	23	N	--
F3-03	Input select 2	X14 Input Function Selection 0~19： X0~X19 23: Thermal switch 24: Light curtain	0~32	14	N	--
F3-04	Input select 3	Spare	0~32	23	N	--
F3-05	Input select 4	Spare	0~32	24	N	--
F3-06	Input select 5	Spare	0~32	25	N	--
F3-07	output select 1	Spare Output Function Selection	0~32	0	N	--
F3-08	output select 2	Spare	0~32	11	N	--
F3-09	output select 3	Y6 Output Function Selection Description of output function code: 0~13：Y0~Y13 6: Side hung door closing output/sliding door locking output 15: Alarm over output 16: Fault indication output 17: Emergency power-off output 19: Non service mode 23: Side hung door opening output/manual sliding door unlocking output 2 5: Lighting control output	0~32	6	N	--

5.4.5 Service Setup Parameters (F4)

Chart 5.10 Service Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Change	Ref Page
F4-00	Set Stop Floor1	Set elevator stop/bypass at floor corresponds to each bit. (1-32 floors)	0~ 4294967295	4294967295	Y	89

Chart 5.10 Service Setup Parameters List (Con'd)

Para No.	Display	Content	Range	Factory Setting	Live Change	Ref Page
F4-01	Set Stop Floor2	Set elevator stop/bypass at floor corresponds to each bit. (33-64floors)	0~ 4294967295	4294967295	Y	89
F4-02	TIM Stop Floor1	Set elevator stop/bypass at floor corresponds to each bit at the set time. (1-32floors)	0~ 4294967295	4294967295	Y	89
F4-03	TIM Stop Floor2	Set elevator stop/bypass at floor corresponds to each bit at the set time. (33-64 floor)	0~ 4294967295	4294967295	Y	89
F4-04	Door Select A1	Set elevator front door enable /disable at floor corresponds to each bit (ON/OFF: Front door enable /disable at this floor)	0~ 4294967295	4294967295(1~32)	Y	87
F4-05	Door Select B1	Set elevator rear door enable /disable at floor corresponds to each bit (ON/OFF: Rear door enable /disable at this floor)	0~ 4294967295	0 (1~32)	Y	87
F4-06	Function Select	Set elevator functions enable /disable at floor corresponds to each bit. (ON: Enable, OFF: Disable)	0~ 4294967295	604125188	Y	91/ 92
F4-07	Function Select 2	Set elevator functions enable /disable at floor corresponds to each bit. (ON: Enable, OFF: Disable)	0 ~ 4294967295	570425388	Y	92/ 94

Note: See more detail of F4-06 and F4-07, please refer to Chart 6.4.

5.4.6 Motor Setup Parameters (F5-F6)

Chart 5.11 Motor Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F5-00	Motor Type	Set motor type (0: sync- outer rotor, 1: async machine, 2: sync-inner rotor)	0~2	0	--	N	94
F5-01	Poles	Motor poles (Nameplate)	1~99	20	--	N	94
F5-02	Sync Freq	Motor synchronous frequency (Nameplate)	0.001~ 200.000	16	Hz	N	94
F5-03	Rated Power	Motor rated power (Nameplate)	1~50	2.2	kW	N	94
F5-04	Rated Speed	Motor rated speed (Nameplate)	1~5000	96	RPM	N	94
F5-05	V IN	Motor counter-EMF (Nameplate)	1~380	280	V	N	94
F5-06	L_phase	Motor phase inductance set. (Auto-tuning/ manual input)	Auto-tuning/Nameplate		mH	N	95
F5-07	R_phase	Motor phase resistance set. (Auto-tuning/ manual input)	Auto-tuning/Nameplate		Ω	N	95
F5-08	Rated FLA	Motor rated current. (Nameplate)	0~99.999		A	N	95
F5-09	NO-Load Current	For asynchronous machine, no-load excitation current.	0.1~50	0	A	N	95

Chart 5.11 Motor Setup Parameters List (Con'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F5-10	Rated Slip	For asynchronous machine rated slip. (Nameplate)	0.1~10	1.5	HZ	N	95
F6-00	Carrier Freq	Set controller carrier frequency.	2~12	8	kHz	N	--
F6-02	SpeedZoom	Speed Zoom (Reduce elevator actual running speed)	0~100	100	%	Y	95
F6-03	DirSel	Select motor running direction (0/1: Motor rotates anti- clockwise, car move down/up).	0/1	0	--	--	95
F6-04	Kp	Speed loop proportional gain. (Valid for complete curve if not used in multiple PI.)	0~65535	600	--	--	96
F6-05	KI	Speed loop integral gain. (Valid for the complete curve if not used in multiple PI.)	0~65535	300	--	--	96

5.4.7 Multiple PI Setup Parameters (F7)

Chart 5.12 Multiple PI Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F7-00	PIMulEnable	Multiple PI parameters 1: Enable; 0: Disable	0/1	0	--	N	96 97
F7-01	PI1 Range	PI available range 1 (Start-middle speed running PI switch frequency)	0~ Rated freq	5	Hz	Y	96 97
F7-02	PI2 Range	PI available range 2 (middle -high speed running PI switch frequency)	0~ Rated freq	0	Hz	Y	96 97
F7-04	PI3 Range	PI available range 4	0~ Rated freq	0.5	Hz	Y	96 97
F7-05	Kp1	PI available range 1 proportional gain	0~2000	1200	--	Y	96 97
F7-06	Kx1	PI available range 1 integral gain	0~2000	900	--	Y	96 97
F7-07	Kp2	PI available range 2 proportional gain	0~2000	1000	--	Y	96 97
F7-08	Kx2	PI available range 2 integral gain	0~2000	600	--	Y	96 97
F7-11	Kp3	PI available range 4 proportional gain	0~2000	600	--	Y	96 97
F7-12	Kx3	PI available range 4 integral gain	0~2000	500	--	Y	96 97

5.4.8 Encoder Setup Parameters (F8)

Chart 5.13 Encoder Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F8-00	Encoder PPR	The encoder pulse count per-revolution.	100~8192	2048	--	N	98/99
F8-02	PGType	PG card type (0: Incremental encoder, 1: Sine/Cosine encoder）	0/1	1	--	N	98/99

5.4.9 Control Setup Parameters (F9)

Chart 5.14 Control Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
F9-00	Max Torq Comp	Maximum torque compensation (torque required to compensate at no load, 100% correspond to machine rated torque.)	0 ~ 100%	0	%	N	89
F9-01	SPDSourceSel	Speed given source selection: 0: Simulation; 1: Multi-segment 2: Internal; 3: Operator	0~3	2		N	--
F9-03	Spderr Set	Speed Deviation Set (100% correspond to machine rated speed.)	0~100	5	%	Y	--
F9-11	Load Comp Enable	Load Compensation: 1 enable; 0 Unable	0/1	0	--	N	97/98
F9-13	Load Source Sel	Weighing source (0: SJT weighing,1: -10-10V weighing, 2: 0-10V weighing)	0/1/2	0	--	N	97/98
F9-19	UP Comp Bias	Up direction (clockwise) Compensation Bias	-100~100	0	--	Y	--
F9-20	DOWN Comp Bias	Down direction (anti-clockwise) Compensation Bias	-100~100	0	--	Y	--
F9-21	FULL Comp Pro	Full load compensation proportion	0~200	100	--	Y	--

5.4.10 No-load Compensation Setup Parameters (FA)

Chart 5.15 No-load Compensation Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
FA-00	StratKP	Start-up proportional gain with no compensation.	0~50000	30	--	N	99
FA-01	StratKI	Start-up integral gain with no compensation	0~50000	1200	--	N	99
FA-04	ZeroKeepKP	Keep Zero speed proportional gain	0~2000	180	--	N	98
FA-05	ZeroKeepKI	Keep Zero speed integral gain	0~10000	550	--	N	98
FA-08	PLKP1	No compensation effect proportional gain 1	1~6500	1200	--	N	99

Chart 5.15 No-load Compensation Setup Parameters List (Con'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
FA-09	PLTime	No compensation effect time	1~1000	900	ms	N	99
FA-11	PLKP2	No compensation effect proportional gain 2	0~50000	300	--	N	99
FA-12	PLKPMOD	No compensation effect proportional factor	0~50000	125	--	N	99

5.4.11 Special Parameters (FC)

Special parameters (FC) are mapping a part of factory parameters (FX) in customer level; users can access this part information by user level password. In these parameters, FC-00~FC-06 can only be viewed but not editable, while other parameters can be changed. Special parameters (FC) number, description and content are shown below in Chart 5.16.

Chart 5.16 Special Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
FC-00	Zpulse_Init	Result of motor angle tuning, same as FX-00.	0~3277	0	--	N	--
FC -07	KpIreg	Current ring proportional (FX-07), **MODIFY WITH CAUTION!**	0~65535	20000	--	N	--
FC -08	KxIreg	Current ring integral (FX-08), **MODIFY WITH CAUTION!**	0~65535	10000	--	N	--
FC-13	AutoTuneModeSel	Sine/Cosine PG card auto- tuning selection (FX-20): 0: Rotation; 1: Stationary;	0/1	1	--	N	--
FC-14	N Temp Alarm Ena	Negative temperature alarm (FX-21) 1: Alarm enable at -15C; 0: Alarm disable at -15C.	0/1	1	--	N	--
FC-15	InitTuneEnable	When using Sine/Cosine PG card, whether need CD signal for position at power up 0: Yes.1: No (Can only set to 0 for SPG-V33 and above) Set to 0 can avoid electric noise at first power up.	0/1	0	--	N	FX-24
FC-16	CD DirSel	FC 15 is available if set to 1. Set to 0 if AB & CD signal in same phase, otherwise set to 1. (Auto selected at motor angle tuning.)	0~3	0	--	N	FX-25
FC-17	Encode Level	Monitor limitation of sin/cos PG card signal disconnection. （Setting it too small may cause fail to monitor encoder disconnection, please be cautious for changing）(same as FX-26)	0~100	60	%	N	--
FC-18	Torque Limit	Permissible output relative to rated percentage torque limit amplitude.	0~200	185	%	N	--

5.4.12 Spare parameters（FD）

Spare parameter (FD) is reserve parameter group, FD-00 to FD-39, totally 40 spare parameters.

Bit setting group (FD-05、FD-21、FD-22、FD-23、FD-39):

Each parameter can be set in a numerical range of 0~65535, which is split into 16 special functions of the ON/OFF set in binary way, which opens (ON) for the binary value of 1, and the 0 is closed (OFF).

Please select the function that you need to open according to the chart 5.17, then set the value of the corresponding position to 1, and then convert the binary value of the whole table to the decimal value to set the FD-XX parameter. The formula is as follows:

FD-XX = BIT0*2^0+BIT1*2^1+BIT2*2^2+...+BIT15*2^15

Chart 5.17 Spare parameter table (FD group)

Bit-setting	Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8
Definition	Function 16	Function 15	Function 14	Function 13	Function 12	Function 11	Function 10	Function 9
Bit-setting	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Definition	Function 8	Function 7	Function 6	Function 5	Function 4	Function 3	Function 2	Function 1

Setting example 1:

When function 12 is enabled, the binary value is 0000 1000 0000 0000 (Bit15~Bit0, Bit11 is 1, the rest is 0).

Converted to a decimal value of 2048 (2 to the power of 11 =2048).

Setting example 2:

Enable function 1, function 2 and function 10 at the same time, the binary value is 0000 0010 0000 0011. (Bit15~Bit0, Bit9, Bit1 and Bit0 are 1, the rest is 0)

Converted to decimal numeric value of 515. (9 square of 2 + 1 square of 2 + 0 square of 2 =512+2+1=515)

Chart 5.18 Special Function Selection 3 (FD-05)

Num.	Function definition	Meaning
FD-05-00	Maintenance operation mode	ON: Open the maintenance operation mode. The main board X5 is the maintenance input signal. It is necessary to reopen this function under the provincial limit mode (F4-07-02=ON), not respond to the call request in the process of maintenance, and the operator is displayed as a special purpose. It only serves the selected instructions in the car and the selected instructions with operating device, which is used for elevator normal running. OFF: Close the maintenance operation mode.
FD-05-01	Spare	Spare.
FD-05-02	Inspection run in power off emergency operation	ON: Inspection can run in power off emergency operation; OFF: Inspection cannot run in power off emergency operation.
FD-05-03	Er39 reset method	ON: Er39 error can only be reset once the system successful complete braking force self-test; OFF: In inspection mode, pressing both slow up and slow down buttons for 5 seconds can reset this error.
FD-05-04	Turn on and off the internal number cancellation function	ON: Turn off the function of internal call repeat cancellation; OFF: Enable the internal call repeated cancellation function.
FD-05-05	Light curtain abnormal alarm	ON: If light curtain is adhering for more than 2 minutes or it lose effectiveness (no action for 8 continuous car call running), car buzzer will alarm; OFF: Turn off this function.

FD-05-06	Spare	Spare.

Chart 5.18 Special Function Selection 3 (FD-05) (Con'd)

Num.	Function definition	Meaning
FD-05-07	Recover torque of door motor when power on	ON: If power on at leveling position, at first time of closing, it will close both front and rear door. If power on at non-leveling position, it will output both front and rear door close for 5 sec. OFF: Turn off this function. When power on, if door close limit is valid, it will not output close door.
FD-05-08	Spare	Spare.
FD-05-09	Car maintenance	ON: Start the car maintenance, the original direct signal is used as the maintenance input, the driver's upward direction is used as the car's slow up, and the driver's downward direction is used as the car's slow down. The car maintenance priority is lower than the car roof and pit.
FD-05-10	Light curtain of auxiliary control panel	ON: Enable the light curtain of the auxiliary control panel; OFF: Do not use the light curtain of the auxiliary control panel.
FD-05-11	Spare	Spare.
FD-05-12	Door service according to floor	ON: The floor set in F4-02/03 will be unavailable to open door.
FD-05-13 ~ FD-05-15	Spare	Spare.

Chart 5.19 Drive Special Function 1 (FD-21)

Num.	Function definition	Meaning	default
FD-21-00	Shielded input phase deficiency protection	Set to 1, will shield the input phase deficiency protection function	0
FD-21-01	Spare	Factory spare, do not set it	0
FD-21-02	Shielded output phase deficiency protection	Set to 1, will shield the output phase deficiency protection function	0
FD-21-03	Shielding open/shorted circuit inference protection	Set to 1, shield the first power on short circuit to inference protection function. If the external fault condition is not relieved and shield it directly, the power module will be damaged.	0
FD-21-04	Shielding temperature adaptive protection	Set to 1, shielded temperature adaptive protection function	0
FD-21-05	Shielding voltage drop adaptive protection	Set to 1, shielded voltage drop adaptive protection function.	0
FD-21-06	Spare	Factory spare, do not set it	0
FD-21-07	Shielding automatic calculation of motor pole logarithm	Set to 1, shielded automatic calculation of motor pole logarithm function.	0
FD-21-08 ~ FD-21-14	Spare	Factory spare, do not set it	0
FD-21-15	Increase deceleration rate of torque cancellation when stop	Set to 1, increase deceleration rate of torque cancellation when stop. Sometimes need to increase F2-10 to ensure the integrity of torque cancellation process.	0

Chart 5.20 Drive Special Function 2 (FD-22)

Num.	Function definition	Meaning	default
FD-22-00 ~	Spare	Factory spare, do not set it	0

FD-22-02			
FD-22-03	Shielding No.159 drive fault	Set to 1, shielding No. 159 drive fault. Please use this function cautiously. If external disturbance is not released, it will cause motor stall and safety risk.	0

Chart 5.20 Drive Special Function 2 (FD-22) (Con'd)

Num.	Function definition	Meaning	default
FD-22-04	PWM Fan Enable	Set to 1, the system starts or stops the fan according to the real-time temperature in the driver board, if the temperature is higher than 45 degrees, the fan starts, when below 40 degrees, and the fan automatically stop.	0
FD-22-05	The first power on automatically enters the motor static tuning	Set to 1, every time the system is powered up, the motor static tuning will be started for the first running, and the original value of FC-00 will be recalibrated.	0
FD-22-06	Forced drive mode enabled	Set to 1, the control system will realize advance torque compensation according to the forced drive mode. This function is restricted to the elevator system with forced drive mode and cannot be used for traction mode. Refer **to Appendix 20 Forced Drive Mode Instruction** for details.	0
FD-22-07 ~ FD-22-15	Spare	Factory spare, do not set it.	0

Chart 5.21 Drive Special Function 3 (FD-23)

Num.	Function definition	Meaning	default
FD-23-00	Perform high voltage range when braking and over-voltage on DC Bus	Set to 1, high voltage mode. If input voltage limit is higher than 480VAC, it need to be set, otherwise it will damage power module and braking resistor.	0
FD-23-01 ~ FD-23-15	Spare	Factory spare, do not set it.	0

Chart 5.22 Drive Special Function 4 (FD-39)

Num.	Function definition	Meaning	default
FD-39-00 ~ FD-39-02	Spare	Factory spare, do not set it.	0
FD-39-03	Balanced Load Noise Suppression	Set to 1, Enable Balanced Load Noise Suppression.	0
FD-39-04 ~ FD-39-15	Spare	Factory spare, do not set it.	0

Byte setting group (FD-04, FD-07, FD-25, FD-26, FD-27):

Chart 5.23 Spare parameter (Byte setting group)

Num.	Function definition	Meaning	Range
FD-00	Duplex support time	If one elevator in duplex is busy, the other elevator will support it after support time.	1~30s
FD-01	Single leveling sensor	When set to 1, it permits single leveling sensor.	0~1
FD-02	UPS open delay	In ARD mode, the time for door keep opening.	10~30
FD-03	IC card address	Inner parameter, do not set it.	0~65535
FD-04	Maintenance reminder	Set FD-04 to non-zero number to activate maintenance	0~1000 day

	function	reminder function, this number means the maintenance period in days. For example, set FD-04=100, which means the maintenance period is 100 days. Thus, this elevator needs to have maintenance at least once in 100 days, otherwise, it cannot operate. Car display and hall display will indicate 'MO'.	

Chart 5.23 Spare parameter (Byte setting group) (Con'd)

Num.	Function definition	Meaning	Range
FD-07	Weighting offset coefficient	Used to set weighting offset coefficient, set to 0 or turn off the load weighting enable function (F1-29=0) will disable this function. When it sets to a non-zero value, the weighting value will have this amount compensation in its positive direction.	0~100%
FD-08	ARD operating speed	Elevator running speed in ARD emergency mode.	0.05~0.3m/s
FD-09	Automatically run tests	The number of times of elevator random automatic operation is set, and the running interval is set by F2-05.	0~60000
FD-10	Running speed setting	Set the maximum running speed under the elevator automatic mode, 0 is invalid.	0~100cm/s
FD-11	Collective selection mode	0: Select all 1: Select upper 2: Select lower 3: Select all.	0~3
FD-12	Mechanical action speed of electronic safety gear	When the elevator exceeds the rated speed of FD-12 *, SPC will act and trigger the electronic safety gear, which requires the cooperation of SPC control board.	105~150%
FD-14	Action type of electronic safety gear	0: Power on action ; 1: SPC control board is required for mains action.	0~1
FD-15	Ultimate distance	Setting the distance between limit switch and leveling requires the cooperation of SPC board.	10~500
FD-16	Limit distance	Set the distance from the limit switch to the leveling, which requires the cooperation of SPC board.	10~500
FD-24	Destination value of braking force testing	The destination value setting for braking force testing	100~250%
FD-25	Rope slipping mode	After setting FD-25 to 1, the system enters the slipping mode. At this time, pressing slow up / slow down button, the system will output the limiting current, so that the limit slip state of the rope can be observed. After setting FD-25 to 1, set the non 1 value again, that will be automatically cancel the slipping mode.	0～5
FD-26	Balance coefficient of elevator	Balance coefficient of elevator.（Unit, %）	40～50
FD-27	The radio of the output current when elevator is empty loaded and travelling downward, to the rated current of motor	The radio of the output current when elevator is empty loaded and travelling downward, to the rated current of motor. (Unit, %)	30~130%

5.4.13 Environment Setup Parameters (A)

Chart 5.24 Environment Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change	Ref Page
A0-00	Language Sel	Language selection	--	ENGLISH	--	Y	--
A0-01	User Password	Input/Setting user level password	000000~999999	000000	--	Y	--

A0-02	Factory Password	Input/setting factory level password	000000~ 999999	000000	--	Y	--
A0-04	Contrast	Setting the LCD contrast level	0~10	5	--	N	--

Chapter 6 Parameters Setup

6.1. Elevator Running Speed Setup

6.1.1 Elevator Rated Speed, Motor Rated Speed, Encoder pulses Setup

1. Elevator rated speed (F1-00) can be calculated through motor RPM, traction ratio, reduction ratio and traction sheave diameter.

Elevator rated speed is used for calculating the ratio between motor rated speed and elevator speed, modifying this parameter cannot change the actual running speed of elevator; if need to change elevator running speed, please modify parameter F6-02 (Speed Zoom)

2. Motor rated speed (F1-01) is the speed of traction machine (RPM) under elevator rated speed.

3. Encoder Pulse (F1-02) is the pulse number of the encoder for hoistway counting at elevator running.

4. Motor rated speed and elevator rated speed much follow the condition below:

$$\text{Elavator rated speed}=\frac{\text{Motor RPM}\times\text{traction sheave diameter}\times 3.14\times\text{speed reduction ratio}}{60\times 1000\times\text{traction ratio}}$$

For example: Motor rated speed is1370 rev/min., traction sheave diameter 590mm, speed reduction ratio: 2/53, traction ratio 1/1, then:

$$\textbf{Elevator rated speed}=\frac{1370\times 590\times 3.14\times 2}{60\times 1000\times 1\times 53}=1.\frac{6m}{s}$$

After setting elevator rated speed, motor rated speed, encoder pulse number, system record the relationships between traction ratio, speed reduction ratio, traction sheave diameter and relationships between shaft counting pulse and running distance. If the setting is incorrect, the following problems may happen:

1) The elevator running speed on digital operator or software is different with the elevator actual running speed.

For example, if encoder pulse or motor rated speed is set to a smaller value, speed indicated on the display will be higher than actual speed, after hoistway learning, floor height learned by the system will be larger than actual height.

2) As the floor height learned by the system is higher, the elevator deceleration curve will be steeper than the setting. This could result elevator cannot get leveling sometimes (running out of leveling zone with sudden brake).

6.1.2 Inspection Run Speed

In inspection mode, elevator runs in slow inspection speed(F1-03), based on international standard, such speed should be no more than 0.6m/s. After elevator reaches top or bottom terminal, the running speed will be reduced to half of the inspection speed.

If bottom/top terminal (X8/X7) is valid, elevator slow down to 1/2 inspection speed to prevent exceeding the limit.

When up/down jogging is cancelled, speed given will be instantly 0 without deceleration curves.

6.1.3 Rescue Speed

In both case the elevator will run in rescue speed (F1-05):

1. Due to fault or other reasons, elevator stops outside leveling zone, after elevator restores, it runs in rescue speed to the nearest floor and open door to release passengers;

2. When there is a hoistway counting error (Er14, Er18), elevator will run at rescue speed to the bottom floor for recalibration; After elevator reaches the bottom terminal, elevator will run at 1/2 of rescue speed to the bottom leveling position.

6.1.4 Least Speed

Least speed curve (F1-06) limits the lowest speed generated in the system. System will choose the elevator speed based on running distance, but the lowest speed is limited here. For certain site with very small floor distance, reduce this value could achieve normal running on this floor. Otherwise elevator cannot park at small distance floor, it will stop at the next floor.

6.2. Normal Running Speed Curve

Elevator can generate several optimal running curves based on rated speed setting to suit for different speed/distance running. But note lowest running speed curve is limited by F1-06.

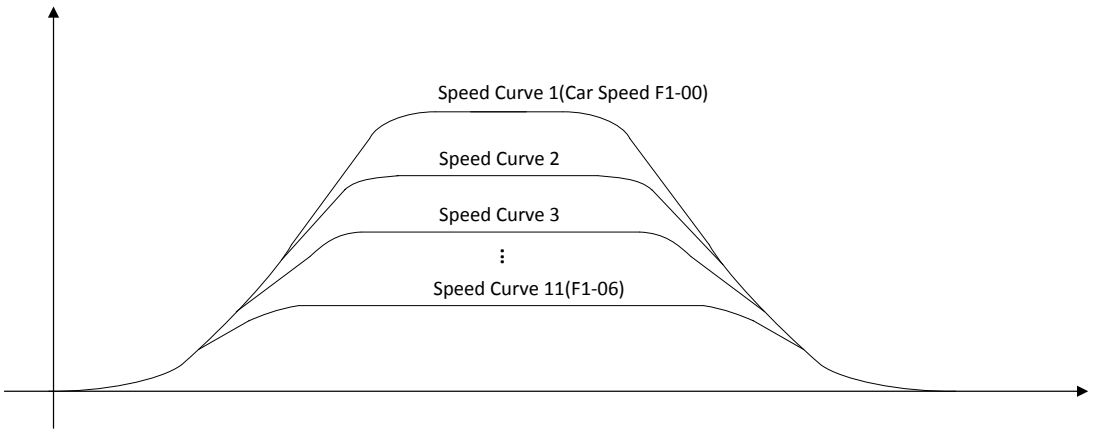


FIGURE 6.1 ELEVATOR RUNNING SPEED CURVE

Acceleration, deceleration for normal running curve and Acce/Dece for S curve are set by the following parameters:

1. F1-10 (Acceleration B1)
2. F1-11 (Deceleration B2)
3. F1-12 (S curve P1)

4. F1-13 (S curve P2)
5. F1-14 (S curve P3)
6. F1-15 (S curve P4)

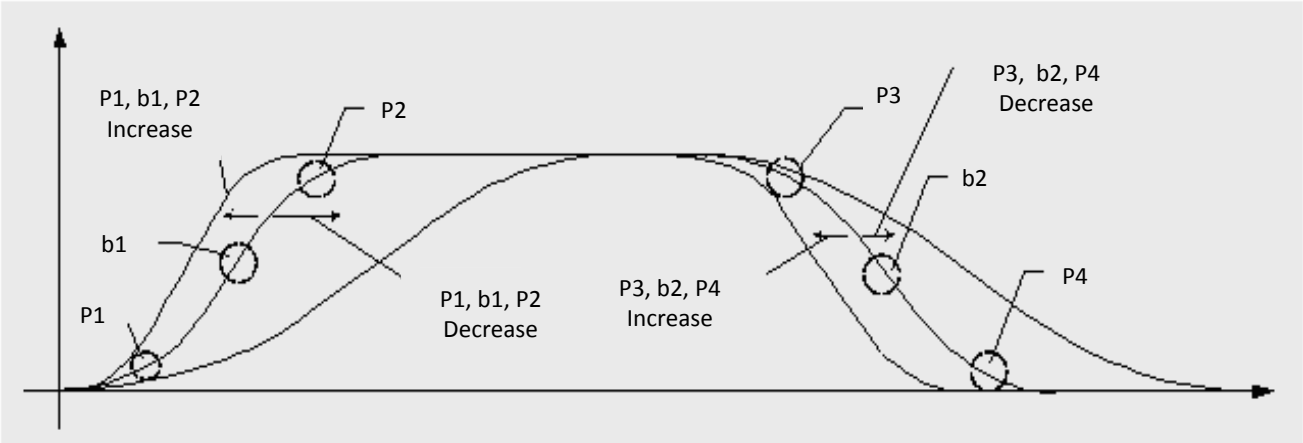


FIGURE 6.2 PARAMETERS ADJUSTMENTS FOR SPEED CURVE

Elevator running comfort level can be set through the above 6 parameters. (Comfort level is also related to the drive control parameters.) The relationship between **b1, b2, P1, P2, P3, P4** and running curve are shown in Figure 6.2.

Increase parameters value, the corresponded curve will be steeper. While decreasing value will smooth the corresponded curve. Adjusting the above six parameters properly can reach good comfort level at elevator running and meet the related standard.

6.3. Elevator Running Timing Diagram

6.3.1 Timing Diagram for Normal Running

The timing diagram for normal running is shown below in Figure 6.3.

If smooth start running speed (F1-04) is set to “0”, smooth start running function will be disabled; smooth start time (F2-13) will be disabled too.

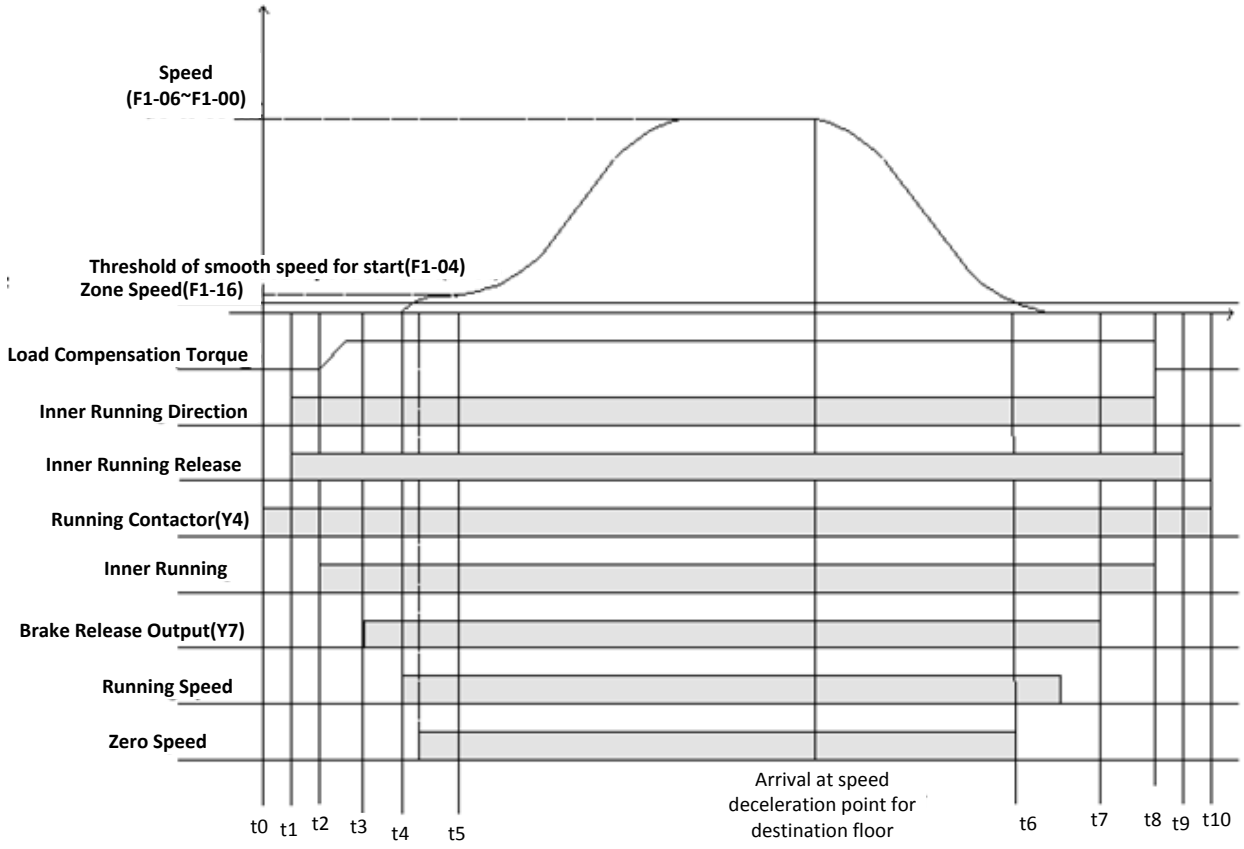


FIGURE 6.3 ELEVATOR TIMING DIAGRAM FOR NORMAL RUNNING

Detail explanation of timing diagram for elevator normal running is explained below in Chart 6.1

CHART 6.1 TIMING DEFINITION FOR ELEVATOR NORMAL RUNNING

Time	Definition and Setup Instruction
t0~t1	Control system will first output running contactor (Y4) command; check for feedback time, if valid then system will give running direction and enable driving control based on the given direction.
t1~t2	Driving module output torque.
t2~t3	Waiting time for internal running signal (F2-03): In this period, driving module complete motor excitation or finish load compensation torque output.
t3~t4	Brake advance release time (F2-00): System output brake release command (Y7), brake release and brake arm feedback valid (e.g.F1-31=1), waiting for brake advance release time (F2-00), and then running speed is given. Two functions for brake advance release time (F2-00): 1. Brake has enough time to release completely; this can avoid elevator startup with brake. 2. After brake release, traction sheave may rotate due to the load, with enough time traction sheave can be steady at zero speed then start in order to achieve comfort feeling at start. Based on the brake condition, set 0.8-1.5s for synchronous machine, and 0.3-0.5s for asynchronous machine.
t4~t5	Smooth start time (F2-13): Elevator runs in start smooth speed (F1-04) for a period at start up, this is to overcome part of the elevator static friction. This is normally set as 0.2s-0.4s, setting it too long may reduce the elevator start efficiency.

Chart 6.1 Timing definition for Elevator Normal Running (Cont'd)

Time	Definition and Setup Instruction
t6~t7	Zero speed time (F2-04): When elevator runs to the destination floor and speed is lower than the zero-speed limit (F1-16), after zero speed time (F2-04), brake release output is disabled. If zero speed time is set too short, brake may close before elevator completely stop. Normally this value is set to 0.2s-0.4s.
t7~t8	Braking time (F2-01): After brake close, due to the subsequent flow and demagnetization, brake cannot lock on the traction sheave immediately and torque output is kept in the meantime. After braking time, system drop internal direction command and torque output. This time can prevent the elevator slip due to braking lag. Based on the brake condition, set 0.8-1.5s for synchronous machine, and 0.3-0.5s for asynchronous machine.
t8~t9	After system drop internal direction command, stop output current immediately may generate large current noise. Time delay (F2-10) can be set to decrease output current gradually, finally stop the elevator after dropping the internal direction command.
t9~t10	Time delay for running contactor open is 0.4s to prevent electric arc when contactor opens with current. But braking, emergency stop, door lock protection does not have time delay, they act immediately.

6.3.2 Timing Diagram for Inspection Running

Timing diagram for elevator inspection running can be seen below in Figure 6.4.

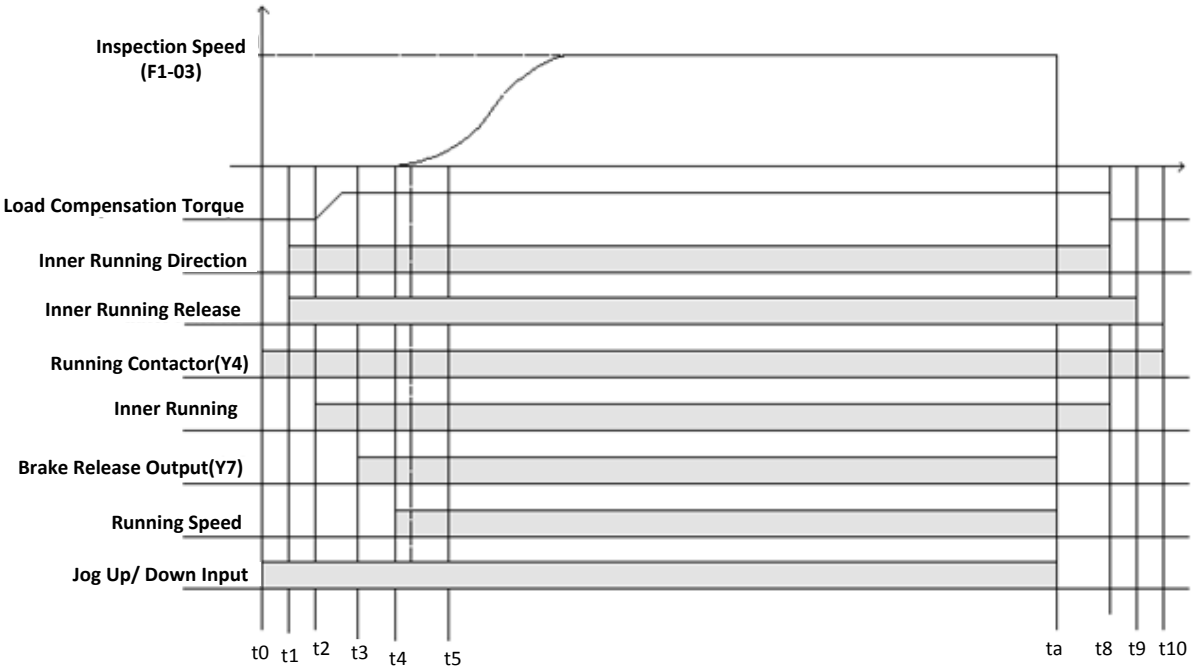


FIGURE 6.4 TIMING DIAGRAM FOR ELEVATOR INSPECTION RUNNING

Definitions and instructions for timing diagram above are shown below in Chart 6.2.

Chart 6.2 Timing Definition for Elevator Inspection Running

Time	Definition and Setup Instruction
t0~t9	Definition for t0~t9 are the same with elevator normal running
ta~t8	Inspection braking time (F2-02): At inspection running stop, system will not wait for elevator zero speed to close brake. When jogging up/down instruction is dropped, brake will close at once (with speed). For some asynchronous traction machines, holding time for torque output too long will result system trigger over-current protection. In this case decreasing the braking time can eliminate such protection. For synchronous machine control, this value should be same under normal running and set as 0.8s-1.5s, for asynchronous machine control, this value should be set as 0.1s-0.3s.

6.3.3 Timing Diagrams for Rescue Running

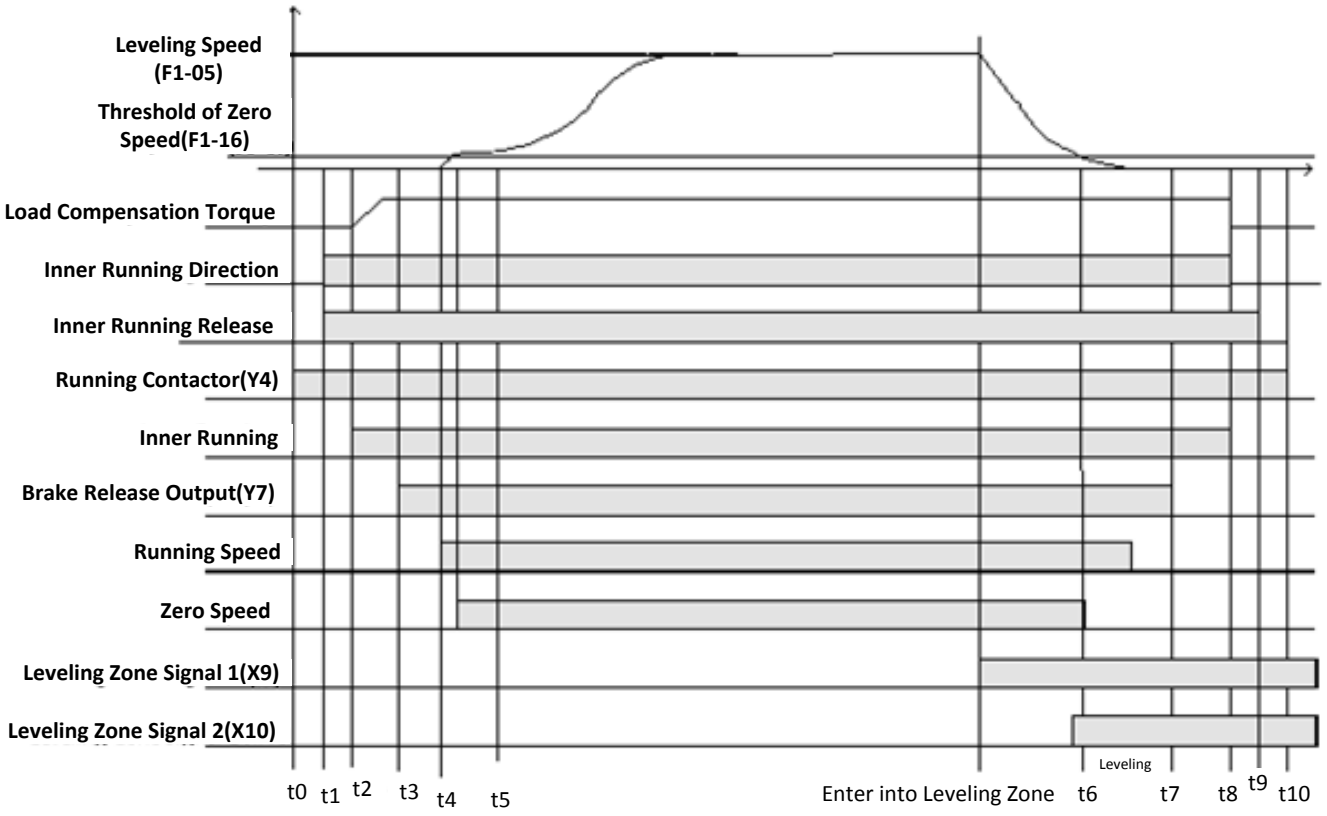


FIGURE 6.5 TIMING DIAGRAMS FOR RESCUE RUNNING (SAME DEFINITION & SETTING WITH NORMAL RUNNING)

6.3.4 Timing Diagram for Recalibration Running

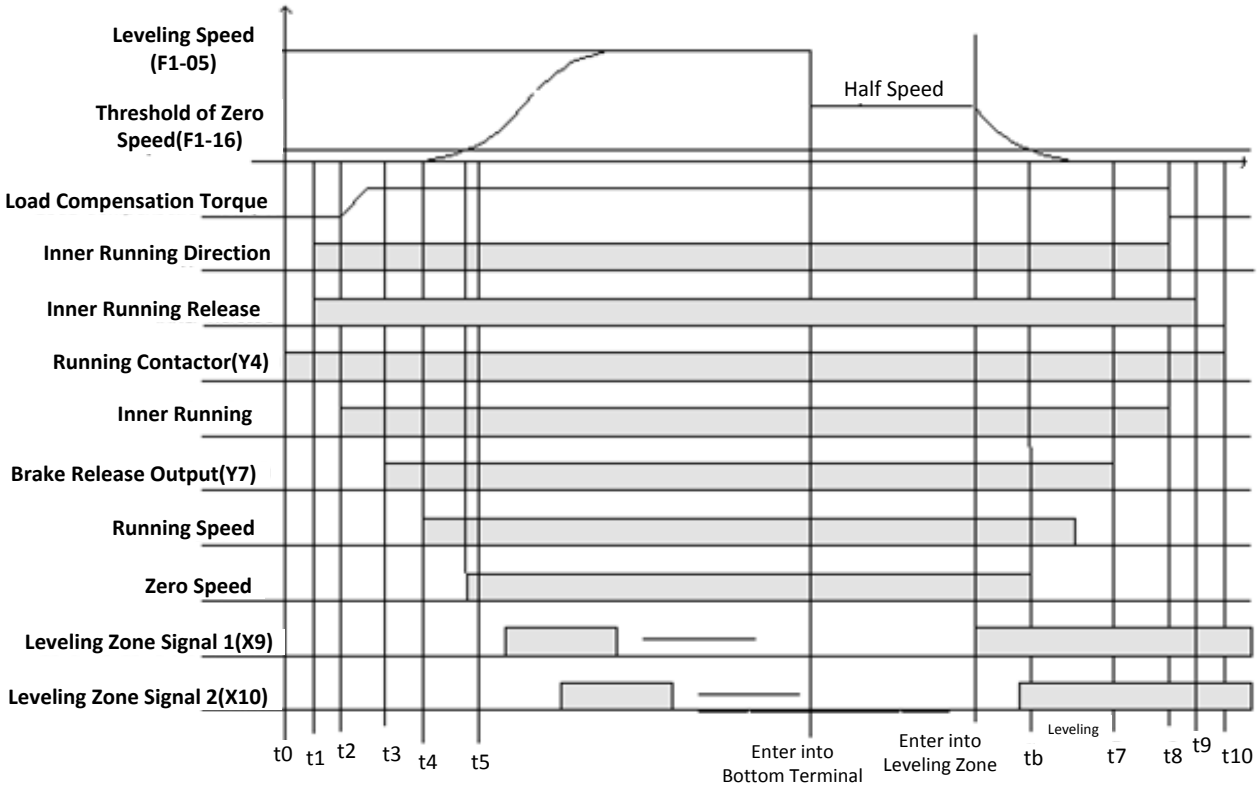


FIGURE 6.6 TIMING DIAGRAMS FOR RECALIBRATION RUNNING (SAME DEFINITION & SETTING WITH NORMAL RUNNING)

6.4. Door Control

6.4.1 Door Open/Close Control

For door control, door open and close time is the related parameter; door limit is the related signal. Timing diagram for door open and close can be seen below in Figure 6.7 and Figure 6.8.

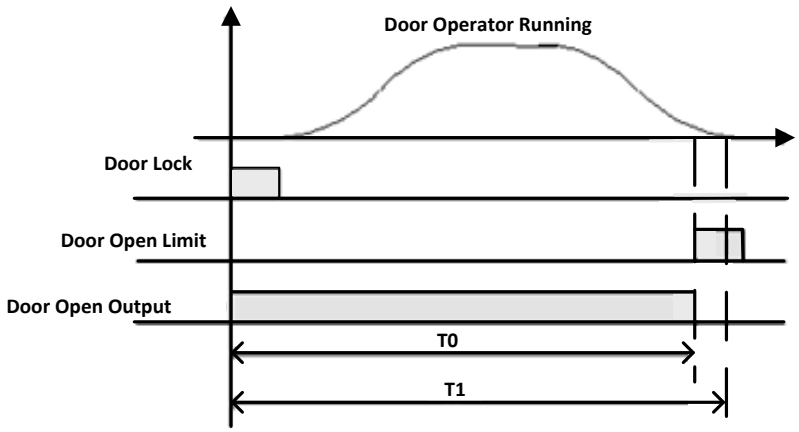


FIGURE 6.7 TIMING DIAGRAM FOR DOOR OPEN

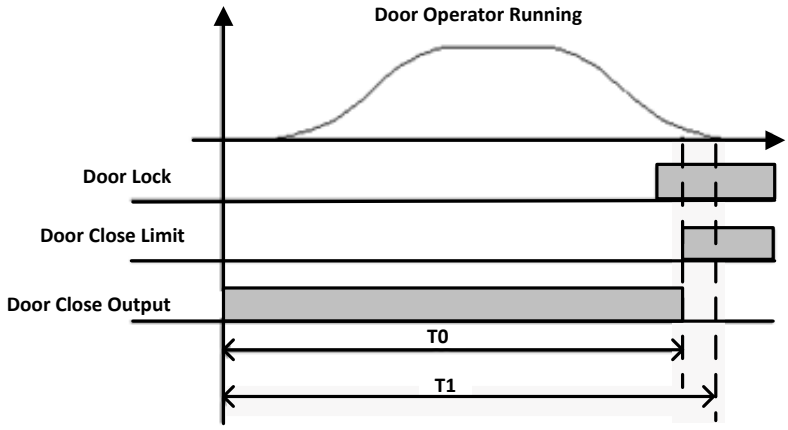


FIGURE 6.8 TIMING DIAGRAM FOR DOOR CLOSE

T0: The actual door-drive running time for door to open or close completely;
T1: Door open or close time (F2-08).
T1 should be 1s more than T0 to ensure the door normal open/close action, otherwise:

1. After system output door close signal, but door dose not close completely after T1 door close time (F2-08), elevator will open the door again, and door cannot be closed.
2. After system output door open signal, but door does not open completely after T1door open time (F2-08), elevator stops the door open action, and door cannot reach the self-lock position.

Door close limit should be fixed in the position where it is only valid after door is completely closed, otherwise:

1. Door cannot close in inspection mode.
2. Door close limit valid, system stops output door close signal, door cannot close, system open the door again.
3. Door close limit is valid, system will open door after set time in F2-08. Door can still be closed under the holding force of door drive, but system will show a door close error, and elevator can run normally.

If the door open/close limit switches cannot be valid after installation, elevator will control door open/close based on time set in F2-08. If door open/close limit signals are normal; the control of door open and close will be based on door open/close limit signals.

6.4.2 Door Open Holding Time

Elevator run in auto mode, after landing, door open, and door will hold for following time:

1. After landing, door open, if elevator has no landing/car call, waiting time is door open holding time (F2-05).
2. After landing, door open, if elevator has only landing call, waiting time is door open holding time (F2-05) minus 2s.
3. After landing, door open, if elevator has both landing/car calls, waiting time is twice of door open holding time (F2-05) minus 2s.
4. If door open delay time (F1-30) is valid (Set as 1), and after door open, door open delay button is pushed, waiting time will be door open delay time (F2-06). After the delay time or press door close button to close door in advance and then reopen door again, door open delay function will be cancelled, unless push door open delay button again after door is open.

5. When elevator enables disabled function, if there are disabled landing/car calls on current floor, waiting time will be door open delay time (F2-06).

6.4.3 Door Control in Attendant and Special use mode

In attendant/special use mode, door must be closed manually. If door driving mode (F1-21) is set to 1, door close will be jog mode, if set to 0, door will close completely after pushing door close button, no need to push the button continuously.

6.4.4 Door Control in Inspection, Fire mode

In inspection mode, door open and close are both jog mode based on international standard.

Door control in fire-mode:

1. In fire mode, if elevator is running, elevator will land to the nearest floor but does not open door, then elevator return to fireman floor.
2. In fire mode, if elevator stops at another floor, door will not open after fully closed, then elevator return to the fireman floor. If door is open, door will close at once, but before the door is completely closed, the door can be opened again by pushing the door open button.
3. If elevator is at the fireman floor, it will open door and hold.
4. In fire mode, except on fireman floor, on all other floors, door can only be controlled in jog mode.

6.5. Homing Function Setup

Elevator in auto mode (no duplex/group control), if there are no landing/car calls in set time, elevator will return to homing floor.

1. Set homing floor (F0-01)
2. Set homing time (F2-07), this function is disabled if set homing time to 0.

6.6. Parking Function Setup

Normal elevator lock input:

1. Electric lock input (serial park) invalid, elevator in auto mode, it will return to parking floor (F0-03) after finishing all car calls.
2. Electric lock input (serial park) invalid, elevator in attendant/special use mode, as door cannot close automatically, after finishing all car calls, door must be closed manually, elevator will then return to parking floor.
3. Electric lock input (serial park) invalid, elevator in inspection mode, it will be locked at once.

Automatic Start/Stop:

1. Electric lock input (serial park) valid, set auto parking (F1-28) as 1, automatic start time (F2-14), automatic stop time (F2-15) to correspond value to enable this function.
2. Electric lock input (serial park) invalid, elevator will enter parking state; cannot set auto start/stop function.
3. In elevator auto stop time and elevator need to run temporarily, turn the electric lock to invalid and restore to valid, elevator will run. After the running, operate the electric lock in same procedures, elevator will re-enter lock mode, until reach auto-start time, then it starts running again.

6.7. Fireman Operation Function Setup

Controller has three kinds of fireman operation mode; fireman mode (F1-23) can be set as "0, 1, and 2":

0: Normal fireman mode: When fireman input is valid, elevator lands to the nearest floor but doesn't open door, then it returns to the fireman floor(F0-02), it opens door and stops, meanwhile it enters into the fireman mode, elevator can run in fireman standard.

1: Fire emergency stop mode: When fireman input is valid, elevator lands to the nearest floor but doesn't open door, then it returns to the fireman floor (F0-02), it opens door and stops. Meanwhile elevator stops running, until fireman input is eliminated.

2: Fireman control mode: It includes two steps, step 1 is fire emergency return, and step 2 is fireman operation. Only after elevator returns to the fireman floor could step 2 be operated.

1) Fireman input switch has two states (ON/OFF); it is connected to BY1-4 of hall call board. Fireman operation switch has three states (ON/START/OFF), ON is connected to fireman input (by-pass input) on COP, START is connected to the door close input in parallel (For fireman to close door, when fireman turns the key to the START position, point ON is still valid, after releasing switch will automatically return to ON.)

   Step 1: Fireman input BY1-4 is valid, if elevator is running, it will cancel all car call and landing call and stop at the nearest floor but doesn't open door and then return to the fireman floor; if elevator is under stop and door open state, elevator will close door at once and return to the fireman floor. After elevator returns to the fireman floor, it opens door and stop running.

   Step 2: Elevator in fire mode, return to fireman floor then stop running; At this time fireman operation running can be activated by fireman operator switch, switch to ON/STAR, elevator will run under fireman operation (Only serve one car call, door open and close follow fireman operation function). After switch to ON/STAR and elevator finished serving fireman operation, if elevator already leave the fireman floor, and switch is turned to OFF, at this time elevator will keep running. Only when elevator returns to the fireman floor again then it will stop running.

2) After elevator enters fire mode, light curtain input will be invalid. Elevator will exit from fire mode only when fireman input switch, fireman operation switch is both in OFF state.

6.8. Rear Door Control Setup

6.8.1 Different Mode Selection

On the same floor, both front/rear doors can be opened; there are different modes (0-n) available based on customer requirements.

Parameters setup for rear door mode is F1-22.

n=0: single door mode.

n=1: Rear door mode 1, only one door acts at every floor.

n=2: Rear door mode 2, two doors can open on some floors, but they cannot open at the same time, if one door needs to be opened, the other door must be closed first. (Two sets of COPs are needed for both front and rear door.)

n=3: Rear door mode 3, two doors can open at some floors, after landing on these floors, two doors open at the same time. (Only one set of COP is needed, HOP calling address is same for both doors.)

n=4: Rear door mode 4, two doors can open at some floors, after landing on these floors, two doors open at the same time. (Two sets of COPs are needed for both front and rear door.)

n=5: Rear door mode 5, two doors can act at some floors, when elevator runs to such floors, door will open as per requirement, for example: front/rear door will open on front/back car call and landing call. Both doors will open on both sides car/landing call. (Two sets of COPs are needed for both front and rear door.)

According to the rear door mode, HOP address setting and COP wiring are different too:

1. HOP address setting

1) When rear door mode on controller is set as **0, 1, 3**, HOP address is same as usual;

2) When rear door mode on controller is set as **2,4,5,** HOP address is set as below:

a) **1~32** is the absolute floor number at front door side:
1 is the bottom floor, **2** is second to bottom floor, maximum number is **32**, total **32** floors.

b) **33~64** is absolute floor number at rear door side**:**
33 is the bottom floor, **34** is second to bottom floor, maximum number is **64**, total **32** floors.

c) If there is only one door on some floors, then the HOP address for the other door is empty.

Example 1: Elevator has one basement floor with both front and rear doors, on this floor HOP address is 1 for front door and 33 for rear door.

Example 2: Elevator has one basement floor with only front door, and one ground floor with both front and rear doors, on the basement floor HOP address is 1 for front door and empty for rear door. On the ground floor HOP address is 2 for front door and 34 for rear door.

2. C.O.P button wiring:

1) When rear door mode on controller is set as **0, 1: 1~N** floor buttons are connected to the COP terminal as usual.

2) When rear door mode on controller is set as **2, 4, 5:** set total floor no. **N,** then the **1~N** car call ports correspond to **1~N** floor car call buttons at front door, **1** is the bottom floor, **N** is the top floor. **N+1~2N** floor car call ports correspond to the **1~N** floor car call buttons at rear door, **N+1** is the bottom floor, **2N** is the top floor.

For example: Elevator has 6 floors (1~6), no basement, 3rd floor has double entrance; other floors have only front entrance. Then car call buttons **1~6** at front door should be connected to **1~6** car call ports, car call button **3** at rear door should be connected to **N+3=6+3=9** car call port.

IMPORTANT **When rear door mode is 1, 2, 3, 4, 5, need to install two sets of door open/close buttons, this is to open front and rear door separately in inspection running.**

IMPORTANT **If rear door mode is 1, and there is one set of door open/close buttons, please set parameter FU18 to "ON". In other mode, if there is only one set of door open and close buttons, in inspection running, only front door can be opened by door open button, rear door cannot be opened by the button.**

6.8.2 Rear Door Condition Setup

Front door setting parameter (F4-04) and rear door setting parameter (F4-05) are required to set front or rear door open on certain floors. In single door mode, these two parameters are invalid. In rear door mode, if set F4-04 to "ON" for some floors, front door can open on these floors, if set F4-04 to "OFF", front door cannot open on these floors. This is same for rear door setup. Please set both doors condition based on actual situation to avoid door open mistake.

6.9. Input Type Setup

Input type on main control board (F3-00) and COP board (F3-01) can be changed based on actual ON/OFF state. When switch is at valid position/state and switch is closed, then its input type is ON. When switch is at valid position/state and switch is open, then its input type is OFF. Input type setup on main control board and COP board can be seen below in Chart 6.3

Chart 6.3 Input Type Setup

Name	Port	Position	Definition	Parameters	Default Input Level	Output Switch Default State	Indicator Default State
Main Control Board F3-00	X0	J2-2	Inspection Input	F3-00-00	ON	OPEN	OFF
	X1	CN1	Run up Input	F3-00-01	ON	OPEN	OFF
	X2	CN1	Run Down Input	F3-00-02	ON	OPEN	OFF
	X3	CN1	Speed governor reset	F3-00-03	OFF	CLOSE	ON
	X4	CN1	Speed governor test	F3-00-04	OFF	CLOSE	ON
	X5	CN1	Spare	F3-00-05	ON	CLOSE	ON
	X6	J2-3	ARD interlock contactor feedback	F3-00-06	ON	CLOSE	ON
	X7	HC-17	Top Terminal 1 Input	F3-00-07	OFF	CLOSE	ON
	X8	HC-19	Bottom Terminal 1 Input	F3-00-08	OFF	CLOSE	ON
	X9	GC-11	Up Leveling Input	F3-00-09	ON	OPEN	OFF
	X10	GC-4	Down Leveling Input	F3-00-10	ON	OPEN	OFF
	X11	D3-11	Brake relay feedback 1	F3-00-11	OFF	CLOSE	OFF
	X12	CN1	Fire protection	F3-00-12	ON	OPEN	OFF
	X13	CN1	Thermal switch monitoring/ multi-function input	F3-00-13	ON	OPEN	OFF

Chart 6.3 Input Type Setup (Cont'd)

Name	Port	Position	Definition	Parameters	Default Input Level	Output Switch Default State	Indicator Default State
Main Control BoardF3-00	X14	CN1	Overload	F3-00-14	ON	OPEN	OFF
	X15	D2-14	Left Brake Feedback	F3-00-15	OFF	CLOSE	OFF
	X16	D3-12	Brake relay feedback 2	F3-00-16	OFF	CLOSE	OFF
	X17	CN1	STO detection	F3-00-17	ON	OPEN	OFF
	X18	D4-10	Spare	F3-00-18	ON	OPEN	OFF
	X19	T2-13	Right Brake Feedback	F3-00-19	OFF	CLOSE	OFF
	X29+	CN1	Emergency Stop Input +	F3-00-29	ON	OPEN	OFF
	X29-	CN1	Emergency Stop Input -				
	X30+	CN1	Door Interlock Input +	F3-00-30	ON	OPEN	OFF
	X30-	CN1	Door Interlock Input -				
	X31+	CN1	Landing Door short detection	F3-00-31	ON	OPEN	OFF
	X31-	CN1	Landing Door short detection				
Car Control Board F3-01	KMV1	PC1-8	Door open limit 1 Input	F3-01-07	OFF	CLOSE	
	GMV1	PC1-7	Door close limit 1 Input	F3-01-06	OFF	CLOSE	
	KMV2	PC2-8	Door open limit 2 Input	F3-01-05	OFF	CLOSE	
	GMV2	PC2-7	Door close limit 2 Input	F3-01-04	OFF	CLOSE	
	KAB1	KAB1-10	Safety Plate 1 Input	F3-01-18	OFF	CLOSE	
	KAB2	KAB2-10	Safety Plate 2 Input	F3-01-17	OFF	CLOSE	
	CZ	LW1-3	Over load Input	F3-01-15	ON	OPEN	
	MZ	LW1-4	Full load Input	F3-01-13	ON	OPEN	
	QZ	LW2-4	Light load Input	F3-01-14	ON	OPEN	
	KZ (50%)	LW2-3	50% Load Input	N/A		OPEN	
	SZH	J5-2(ZLB)	Attendant Input	N/A		OPEN	
	SZY	J5-4(ZLB)	Special Use Input	N/A		OPEN	
	SZS	J6-2(ZLB)	Drive by-pass Input	N/A		OPEN	
	ZHS	J4-2(ZLB)	Attendant Up	N/A		OPEN	
	ZHX	J4-4(ZLB)	Attendant Down	N/A		OPEN	

6.10. Service Floor Setup

Non-stop floors in the system can be set through F4-00 and F4-01. For the floors that elevator can land, set "ON", for the floors that elevator cannot land, set "OFF". After setting F4-00, F4-01, elevator cannot land to the set floors in any case. Based on this function (refer to the function selection Chart), non-stop on certain floor in set time function is available too. Between the non-stop beginning time (F2-14/15) and ending time (F2-16/17), if elevator cannot land on some floors, please set the non-stop floors by setting F4-02 and F4-03 "OFF".

6.11. Weighing Device Setup

When using SJT-151 or SJT-201 weighing device, load detection is available through communication with main control board on CAN BUS. See below for setup procedures:

1. Enable weighing device F1-29=1, F9-11=1;
2. Perform light load and full load self-learning procedures;
3. According to the compensation condition, adjust the compensation coefficient F9-00.
4. For elevator with no compensation chain, adjust F1-18 based on actual condition on top and bottom floor:

   a) Adjust the simulated load compensation gain in inverter until elevator runs down from top floor with no sliding;

   b) Move the empty elevator to bottom floor, increase load compensation adjustment parameter until elevator runs up from bottom floor with no sliding;

   c) The adjustment range for this parameter should be 0-12.

6.12. Leveling Adjustment Setup

After elevator landing, if elevator speed curve has no problem (i.e. there is no sudden stop and overrun leveling zone at elevator landing) and elevator runs outside leveling zone (it stops higher than leveling zone in up-running, lower than leveling zone in down-running), need to decrease leveling adjustment parameter F1-17 (default 50); if elevator cannot reach leveling position(it stops lower in up running, higher in down running), increase leveling adjustment parameter F1-17, general range for adjustment is 40-60, if the adjustment is big, please adjust driving parameter PI, or speed curve shape (F1-10~F1-15).

6.13. Floor Indication Setup

In parameter F0-05~F0-69, we can set third bit display, first two bits can be figure, characters or "- ", third bit can only be the following capital characters: ABCDEFGHIJKLMNO. If only need two bits, set the first two bits only and third big is empty. (Third bit indication should be supported by the HOP board, otherwise it cannot display normally.)

6.14. Special Function Selection

To meet certain special requirements from customers, this control system has included some customized functions (F4-06 & F4-07).

Chart 6.4 Special Function List

Number	Instruction
F4-06-00	After elevator stops, based on current floor, if there is no landing/car call ahead of the current floor in previous running direction, system will cancel all the car calls.
F4-06-01	ON: the monitor input menu of the main board indicates that the signal is valid or invalid, which is the signal state processed through the input type. The default value is OFF.
F4-06-02	ON: Levels the car first to evacuate passengers on the nearest floor in the first place then return to base floor; OFF: Elevator won't level the car, but directly return to base floor and then open door and evacuate passengers.
F4-06-03	ON: Shielded communication interference Er29 fault.
F4-06-04	ON: Enable the X32 detection point of the hall door behind the through door; OFF: X32 checkpoint is not enabled.
F4-06-05	ON: Elevator disable cabin overload signal, this is used in elevator 125% load test (This parameter cannot be saved. After power failure, it will resume OFF.); OFF: Overload signal enable.
F4-06-06	ON: When the elevator cannot open door in current floor (Open Door fault in controller), it will automatically go to the next floor and open door.
F4-06-07	ON: Floor number display change after elevator enter landing zone; OFF: Floor number display change after elevator change speed.
F4-06-08	ON: When elevator stops in inspection mode, brake will close after receiving zero speed signals to reduce impact.
F4-06-09	ON: Elevator can cancel registered car call while running (If all registered call canceled, elevator stop in nearby floor)
F4-06-10	Inner test. ON: Force to use the curves without line segments.
F4-06-11	ON: Cancel emergency stop contactor in the Control cabinet.
F4-06-12	The high voltage entrance of the hall door and the car door are separately detected, x30 is the hall door, and the X31 is the car door.
F4-06-13	ON: In the control cabinet, the door interlock contactor is cancelled, the high voltage detection is used as the state detection of the door lock loop, and the detection and fault of the feedback of the door interlock contactor are cancelled.
F4-06-14	ON: Enable elevator function for disabled people. OFF: Disable elevator function for disabled people.
F4-06-15	ON: In Fire mode when elevator leaves fire floor then disables fire linkage output.
F4-06-16	ON: When door lock is closed, door close limit must be valid too, except inspection mode. OFF: Door lock state is not related to door close limit. Forced detection of bypass operation cannot be cancelled even if it is set to OFF.
F4-06-17	ON: Enable the self rescue function in the car; OFF: Turn off the self rescue function.
F4-06-18	ON: In two-door mode, elevator only installs one set of door open& close buttons. OFF: In two-door mode, elevator installs two sets of door open & close buttons.
F4-06-19	ON: Enable re-levelling with door open function. (Need to use SJT-ZPC-V2A re-levelling control board) OFF: Disable re-levelling with door open function.
F4-06-20	ON: Enable door open in advance function. (Need to use SJT-ZPC-V2A re-levelling control board) OFF: Disable door open in advance function.

Chart 6.4 Special Function List (Cont'd)

Number	Instruction
F4-06-21	ON: In inspection mode, door cannot open outside levelling zone. OFF: In inspection mode, door can open at any position.
F4-06-22	ON: start pit maintenance; OFF: maintenance without pit.
F4-06-23	ON: Use SJT-300/201 weighing device through CAN BUS; OFF: Use SJT-151 weighing device through RS485.
F4-06-24	Spare, default is OFF.
F4-06-25	ON: In inspection mode door open/close switch in car is **invalid;** OFF: In inspection mode door open/close switch in car is **valid**;
F4-06-26	ON: Close light-load anti-nuisance function, passengers can input more than three car calls in light-load mode.
F4-06-27	ON: Change direction after zero speed. OFF: Change direction after brake is off.
F4-06-28	ON: Use light curtains/safety plates separately, the light curtain signals can be shield when the light curtains adhesion or in fire mode for more than 2 minutes. When this function is enabled, the light curtain and the touch plate signal of the original car are transformed into a pure light curtain signal. The driver mode up and down direction of the original car are transformed into a safe touch plate signal of the front and rear door. After shielding the light curtain, it will only detect the touch plate signal after the light curtain adhesion.
F4-06-29	Spare.
F4-06-30	ON: Integrated controller LED has reverse display. This is used for G-series cabinet in roomless elevator (where control board is placed reversely) OFF: Integrated controller LED has normal display. (Default Settings)
F4-06-31	ON: manual door/side hung door; OFF: Automatic door.
F4-07-00	ON: When ARD function is active, system will open brake for 1s (when sliding speed >0.1m/s, brake will close again), it will then find the heavy load direction based on the sliding direction, use battery to land the cabin on heavy load direction and reduce leveling energy cost.
F4-07-01	ON: Enable elevator data recorder. Together with PC debugging software, after-sales/service team can provide fault diagnosis.
F4-07-02	ON: The manual door can be closed and locked after there is a layer selection command; OFF: Automatic door closing after manual door opening.
F4-07-03	ON: Enable serial connected electric lock.
*F4-07-04	ON: elevator door-open and hold function. (including base station floor, internal selection and external call, then automatically close the door.)
F4-07-05	ON: Enable serial connected fire-linkage signal.
F4-07-06	ON: the input type of serial fire-linkage signal is reversed.
F4-07-07	ON: Enforce the hitting ceiling and touching ground protection. If car speed inside leveling zone is still faster than rescue speed, then the car will be forced to stop in leveling zone by leveling zone correction.
F4-07-08	ON: Main board X14 input is used as over load signal input.
F4-07-09	ON: Main board X13 input is used as full load signal input.
F4-07-10	Spare.
F4-07-11	Spare.
F4-07-12	ON: In Auto(normal) mode, car stops three times answering car call without light-curtain action, the car call registration will be cleared.

Chart 6.4 Special Function List (Cont'd)

Number	Instruction
F4-07-13	ON: Enable door-squeezing function to avoid door lock circuits open frequently in auto running mode which is caused by door operator lacking self-locking force.
F4-07-14	ON: Use communication car roof for maintenance; OFF: self applicable car roof maintenance signal.
F4-07-15	On: During self-rescue leveling in emergency and self-save leveling outside door zone, the beeper on the COP keep alarming (the interval is 1 second) while the car is moving.
F4-07-16	On: The elevator can run between an ultra-short floor spacing（less than 80cm& more than 30cm）.
*F4-07-17	ON: Enable VIP function; OFF: Turn off the VIP function.
F4-07-18	ON: The car waits at homing floor with door open.
F4-07-19	ON: In UPS running mode, the elevator will return to homing floor directly. While ON, F4-07-00 and F4-07-25 will be ineffective.
F4-07-20	ON： Enable TIM Stop Floor function. Stop floor time set1 Start time: F2-18 & 19; End time: F2-20 & 21 TIM stop floor time set1 corresponds Set Stop Floor parameter is: F4-00 Set Stop Floor1, F4-01 Set Stop Floor2. Stop floor time set2 Start time: F2-14&15; End time: F2-16 & 17(multiplexing start time/stop time setting). TIM stop floor time set2 corresponds Set Stop Floor parameter is： F4-02 Set Stop Floor1, F4-03 Set Stop Floor2.
F4-07-21	ON: With one and only one door zone signal, the elevator will still level while it turns from inspection to auto or from error to normal or runs in ARD mode. It will avoid that the car door vane cannot drive the hall door when it is too short.
F4-07-22	On: disable the car arrival-bell to avoid disturbing during 22：00~7：00am.
*F4-07-23	ON: When error occurs in up running except top floor or down running except bottom floor, elevator slow down and stop, but not suddenly stop.
F4-07-24	ON: Elevator return to homing floor to proofreading level number when power on for the first time.
*F4-07-25	ON: Before self-rescue, open brake and keep the elevator at zero speed and lock the direction of torque, then self-rescue to opposite direction of the torque. While ON, F4-07-00 is ineffective.
F4-07-26	Spare.
F4-07-27	ON: Enable brake force self-test function. Automatically start at 2:00AM or manually start by modify F4-07-30.
*F4-07-28	Spare
F4-07-29	ON: Levelling adjustment can be adjusted in layers, add adjustment value of 1~64 layer in parameters，all the Default values are 50mm. (The new adjustment method can be adjusted through the combination buttons in the car.
*F4-07-30	Each time turn to ON from OFF, act brake force self-test once. Keep ON will be ineffective.
F4-07-31	ON: Open the operation mode without opening the door; OFF: Close the operation mode of not opening the door.

Note: Please notice the function number with "*" and distinguish software version.（U5-00）

6.15. Motor Parameters Speed Setup

First, please set the motor parameters based on actual machine.

F5-00: motor type. 0: synchronous outer rotor machine; 1: asynchronous machine, 2: synchronous inner rotor machine.

Please make sure the machine type is set correctly, as system will perform motor auto-tuning and vector control based on motor type.

Also, please input following motor parameters based on the machine nameplate or user manual to ensure the accuracy of system generated motor digital model and vector control coupling.

1. F5-01: Motor poles
2. F5-02: Motor rated frequency
3. F5-03: Motor rated power
4. F5-04: Motor rated speed (RPM)
5. F5-05: Motor back-EMF (this parameter is only valid for asynchronous machine)
6. F5-06: Motor phase inductance (this parameter can be acquired from motor auto-tuning)
7. F5-07: Motor phase resistance (this parameter can be acquired from motor auto-tuning)
8. F5-08: Motor rated current
9. F5-09: No-load current (this parameter is only valid for asynchronous machine, it can be acquired from motor self-learning)
10. F5-10: Motor rated Slip (this parameter is only valid for asynchronous machine)

Note: 1. Beside above, when some parameters are not accurate, please perform motor parameter auto-tuning.

2.For the drive versions above 7107, parameter auto-tuning is not necessary.

6.16. Elevator Running Speed Setup

Elevator rated speed (F1-00) and motor rated speed (RPM) (F1-01) are used to calculate the ratio between elevator rated running speed and motor RPM. Also, with encoder pulse number per cycle (F1-03), we can get the relationship between each pulse and traveling distance in hoistway, and this achieves the distance detection of elevator running. Therefore, changing F1-00, F1-01 will only change their ratio, but not elevator actual running speed.

When F1-03 for hoistway counting is from inner pulse source, pulse number in one cycle (F1-03) = pulse number of motor encoder (F8-00) / PG frequency division ratio (F8-01). Rated speed of traction machine (F1-01) = Motor rated speed (F5-04).

If F1-03 for hoistway counting is from outer pulse source (i.e. speed limiter encoder, must adopt special PG card), F1-03 should be set as pulse number in one cycle from outer pulse source, rated speed of traction machine (F1-01) = Outer pulse source speed (i.e. speed limiter speed).

Speed given instruction can be seen below in Figure 6.10.

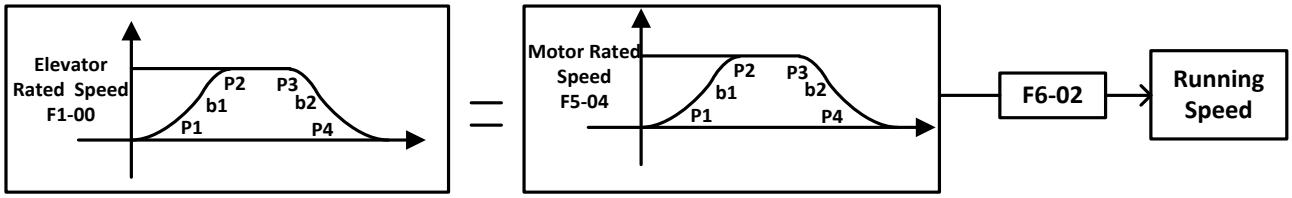


FIGURE 6.10 SPEED GIVEN INSTRUCTION

If need to reduce the elevator actual speed, please change the value of speed ratio (F6-02), when F6-02=100%, elevator runs in rated speed; reduce F6-02 elevator actual speed will decrease in corresponded ratio.

6.17. Speed Control Setup (PI Adjustment)

6.17.1 Speed Control Setup with Single PI Adjustment

For speed control under vector control, there are two ways, F7-00: when multi-section PI enable is set 0, PI does not change with speed given change. Instead, it is a fixed value for the whole elevator speed range, which simplifies setup procedures.

This is the most used method; the flow diagram can be seen below in Figure 6.11.

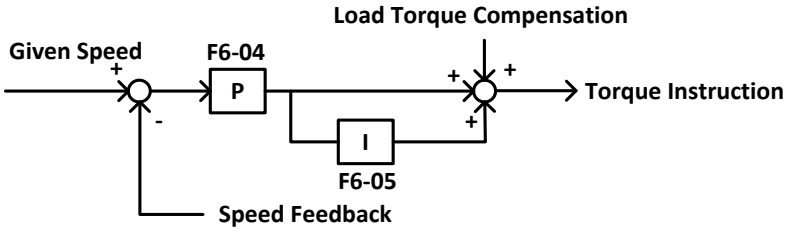


FIGURE 6.11 SPEED ADJUSTMENTS 1

6.17.2 Speed control Setup with Multi-Section PI Adjustment

For speed control under vector control, F7-00: multi-section PI enable is set 1, speed control function can be performed by PI changed in multi-section. In this control mechanism, parameters in F6-04 and F6-05 will not take effect all the time, instead, 4 groups of PI value F7-05~F7-12 are used to perform speed control.

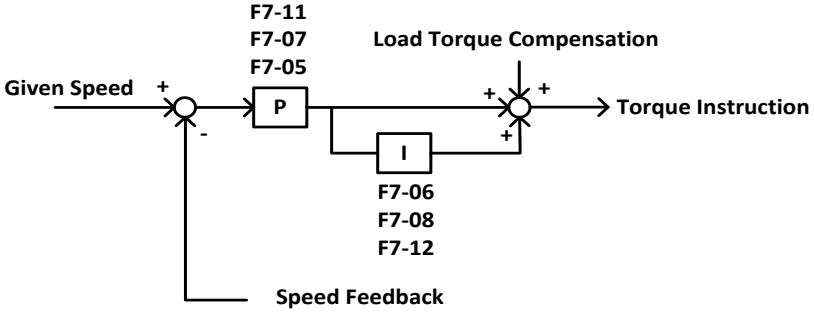


FIGURE 6.12 SPEED ADJUSTMENTS 2

F7-05, F7-06: Group 1 PI; it is generally adopted in low speed period at motor start.
F7-07, F7-08: Group 2 PI; it is generally adopted in middle speed section at acceleration period or steady-speed section at low speed period.
F7-11, F7-12: Group 3 PI; it is generally adopted in deceleration period.
Switching frequency for the above groups of PI parameter are set in F7-01~F7-04: frequency setting of PI effective range.

Group 1 PI effective range:

When motor starts from zero speed or in acceleration period, if the current frequency given is smaller than F7-01, system will adopt F7-05, F7-06 of group 1 PI to adjust the speed. To enable elevator quick stable at zero speed when brake release and follow the speed curve quickly in initial acceleration, F7-05 and F7-06 can be set slight bigger.

Group 2 PI effective range:

After motor starts, when speed (acceleration) is larger than the set frequency in F7-01 and smaller than F7-02, system will adopt F7-07, F7-08 of group 2 PI to adjust the speed. When motor running speed is larger than the set frequency in F7-02, system will adopt F6-04 and F6-05.

Group 3 PI effective range:

When motor speed is smaller than the set frequency in F7-03 (deceleration), system will adopt F7-11, F7-12 of group 3 PI to adjust the speed. This group of PI parameters is used for adjustment in deceleration to stop period. If F7-03 is 0, system will adopt the last group of PI parameters before deceleration.

For different groups of PI effective range please see Figure 6.13 below.

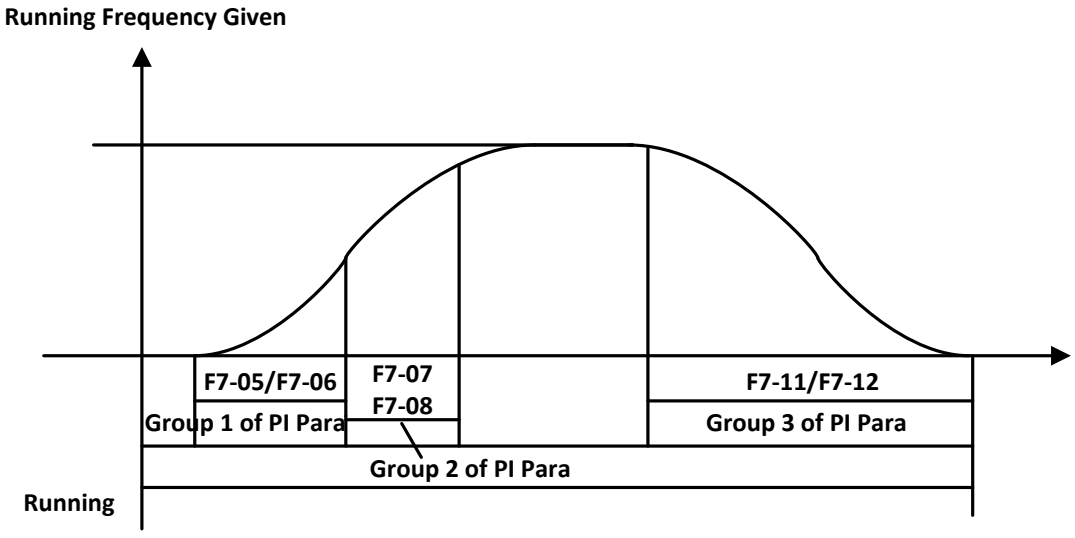


FIGURE 6.13 EFFECTIVE RANGES FOR DIFFERENT GROUPS OF PI

6.18. Load-Compensation Torque Output Setup

Parameters related to load compensation torque output control:

1. The parameters related when using of weighing device:
   1) F1-29: Weighing device enable (1: enable, 0: disable)
   2) U6-03: weighing value, the current load situation
   3) F1-18: weighing adjustment, adjust the compensation according to floor number, it is suitable for elevator without compensation chain.
2. Load simulative input, input range+10V~-10V or 0V~+10V, this input cannot be changed.
3. Load compensation source selection F9-13,
   0: Internal serial signal, it can only be used with the weighing device;
   1: External simulative input +10V~-10V;
   2: External simulative input 0V~+10V.
4. Maximum torque compensation F9-00; if set to 60%, the maximum output torque compensation at full load will be 60% of the rated torque.
5. Torque control output enable F9-11; if set to "1", system will output torque based on the source of F9-13 and multiply by F9-00; if set to "0", load compensation is disabled.

Output control diagram of load compensation torque can be seen below in Figure 6.14.

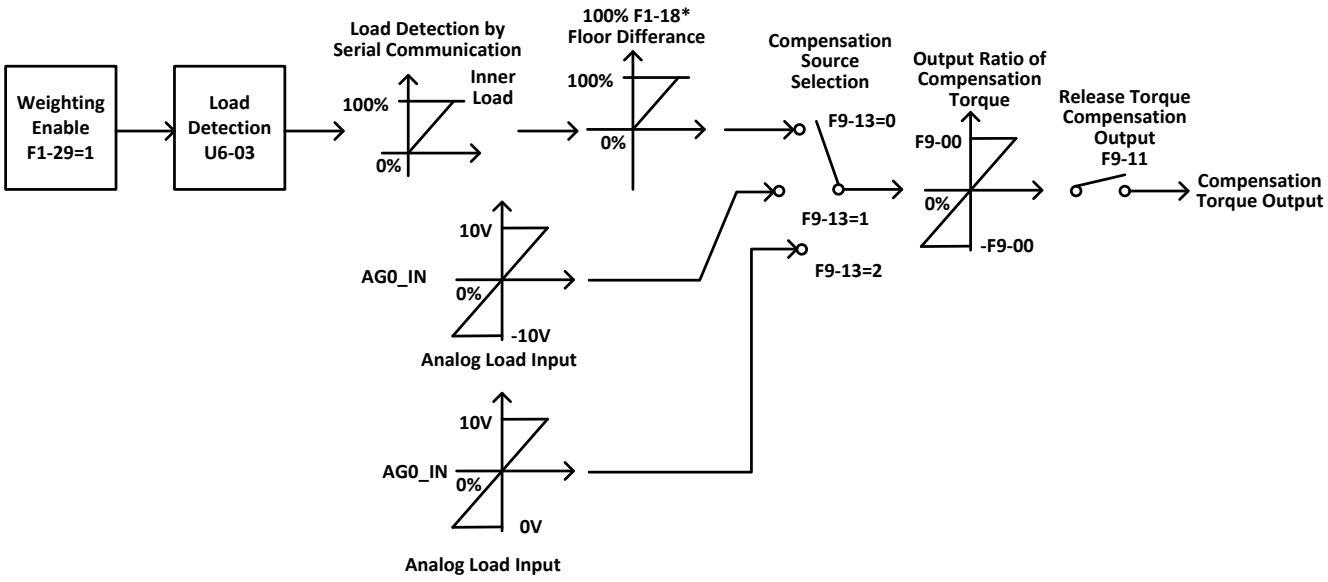


FIGURE 6.14 LOAD COMPENSATION TORQUE OUTPUT CONTROL

6. In synchronous machine control, as there is no compensation chain for low building, weighing device can only measure the load in cabin and cannot detect the rope weight variation on different floor. In this case load compensation adjustment (F1-18) need to be used.

Adjustment Procedures:

1) Perform no-load, full-load learning;

2) Run the no-load elevator to top floor;

3) Adjust simulative load compensation gain in inverter until elevator does not slide when runs down from top floor.

4) Run the no-load elevator to bottom floor, increase the load compensation adjustment parameter (F1-18) until elevator does not slide when runs up from bottom floor.

6.19. Encoder Parameters Setup

Set F8-00 based on encoder pulse number. Encoder pulse usages can be seen below in Figure 6.15.

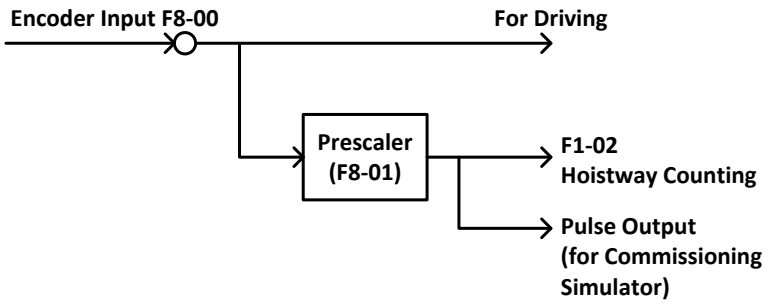


FIGURE 6.15 ENCODER PULSE USAGES

6.20. Start without Load Compensation Setup

When using NS05 series integrated controller with Sine/Cosine PG card, it is possible to achieve comfort start without load compensation by proper setup in FA group parameters. (It means elevator can reach the same effect of load compensation even without weighing device.)

1. Note for starting without load compensation:

1) PG card type, F8-02 is set to "1" (Sine/Cosine PG card)

2) Weighing compensation invalid, confirms F9-11 is set to "0" to disable weighing compensation and enable FA group parameters.

3) Drive software version confirm version is 0005 or above.

2. Adjustment method for elevator starting without load compensation:

1) Principles: As can be seen in Figure 6.16 below, when brake open, based on the position feedback from Sine/Cosine PG card, system can calculate the necessary torque required for motor to remain the steady position under current load, and it gives corresponded torque at once to minimize the traction sheave movement and to achieve comfortable start.

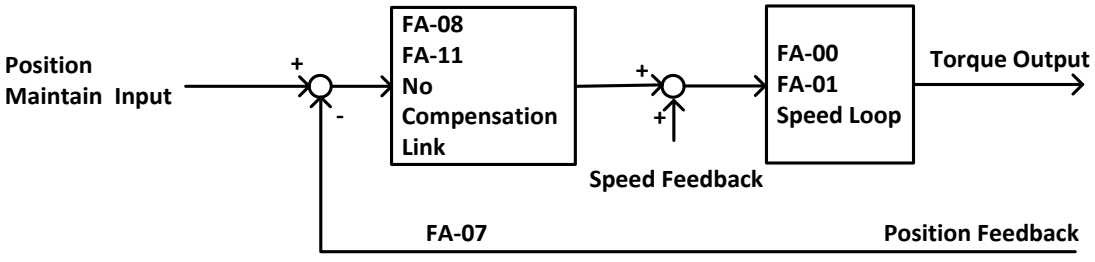


FIGURE 6.16 FLOWCHART FOR ELEVATOR STARTING WITHOUT LOAD COMPENSATION

2) Parameters: Parameters related to function can be seen below in chart 6.5.

Chart 6.5 Elevator start without load compensation parameters list

Para No.	Display	Factory Setting	Fast Brake Recommendation	Slow Brake Recommendation
FA-00	StratKP	30	KEEP	KEEP
FA -01	StratKI	1200	KEEP	KEEP
FA-04	ZeroKeepKP	180	KEEP	KEEP
FA-05	ZeroKeepKI	550	KEEP	KEEP
FA -08	PLKP1	1200	1800	1200
FA -09	PLTime	900	700	KEEP
FA -11	PLKP2	300	KEEP	KEEP
FA -12	PLKPMOD	125	KEEP	KEEP
F2-00	Brake ON Time	1	0.9	1
F9-00	Max Torq Comp	0	KEEP	KEEP
F9-11	Load Comp Enable	0	0	0

3) Adjustment method: Main parameters used are FA-08, FA-09 and FA-11.

FA-09

This parameter is the working time for starting without load compensation after brake opens, it must be set according to the actual brake opening time, if the time is too short, elevator will slip as this action will be over before brake fully opened; Also the value of F2-00 (brake opening time before running) must be 100ms longer than the value of FA-09, so that this action can finish before speed curve start.

FA-08 and FA-11

Two gain parameters for the starting without load compensation action, these two parameters can be adjusted according to the elevator slipping condition and comfort level, if the slipping is too much please increase the value of FA-08; if the traction machine gets vibration, please reduce this value; during the period of torque keeping, if there is slight slipping or small back-and-forth movement on traction sheave, please increase the value of FA-11, if there is vibration, please reduce this value.

1. **During commissioning, besides the mentioned 3 parameters, other FA group parameters can be kept with factory setting.**

2. **For different versions of program, the name of FA group parameters might be different, but their positions remain the same. As a result, only adjust FA-08, FA-09, FA-11 despite the operator version.**

3. **The setting value of above parameters is just for reference, as the PG card is not same in different job side; please adjust above parameters based on site condition.**

4. **F9-00 is the pre-set torque when the starting without load compensation function is enabled. Generally, there is no need to change its value, please keep it with factory setting (0)**

6.21. Remote monitor

Controller supports remote monitor function. Connect controller with assorted WCR remote monitor module, it will use same CAN Bus with COP/HOP communication. Set relative parameters, then remote monitor can be achieved. Parameter setting is as follow,

1. Set Remote monitor enable, F1-27=1;

2. Save parameter.

Chapter 7 Commissioning

7.1. Important Reminder

1. Thanks for purchasing our product, please read this manual and related instruction thoroughly before processing with installation, connection (wiring), operation, maintenance and inspection. To avoid any damage/loss of the products or accident to people, please make sure you have sound knowledge of the device and familiar with all safety information/precautions before processing to operate the control system.
2. Before commissioning and running the product, please read the manual carefully and refer to this manual during commissioning and running.
3. Make sure that all the mechanical devices are installed properly beforehand, especially the devices in hoistway (the devices that should be set in the machine room depends on the situation of the machine room).
4. Make sure that the installation and commissioning for the devices, which should be finished before commissioning of the control system, have been completed.
5. Before commissioning, it is necessary to get signature confirmation from a person responsible for mechanical installation and commissioning.
6. Make sure that all the mechanical devices and other devices which are related to the system commissioning are installed and tested properly.
7. Make sure that there are no unsafe factors which could cause injuries and damages to personnel and devices.
8. Commissioning should be carried out by qualified personnel.
9. Site should meet the conditions for commissioning and running.
10. When doing commissioning for both electric and mechanical parts, technicians for both parts should collaborate.
11. If this manual could not meet your requirement, please contact our company at once to acquire help and to avoid accident and loss.
12. Before system commissioning, make sure all the conditions are sufficiently prepared.

7.2. Inspections before Power On

After electric system is installed, please check the electric system carefully and pay attention to the following items:

1. Compare with the manual and electric diagram, check if the connections are all correct.

2. Check if there is interference between high voltage part and low voltage part. Use a multi-meter to measure the resistor in different circuit, resistor to earth must be infinity big.

3. Please check if wiring from power supply to the control cabinet and traction machine is correct, this is to avoid damaging the controller after powering on.

4. Check wiring between encoder and controller, coaxial degree of encoder and traction machine shaft, wiring between encoder and traction machine.

1) Check if the enclosure of the controller and motor, cabin, landing door are reliably earthed to ensure the safety to personnel.

CAUTION
Controller enclosure and motor enclosure should be earthed to one point.

2) Make sure correct wiring of the terminal block **J1** on control board to avoid any damage to the main control board.

CAUTION
Controller has special digital operator, it should be connected to the socket J232 on main control board by a special cable before commissioning. USB serial communication cable is also available; connect it to the port USB0 on main control board to computer, then do commissioning with special software. (please refer to commissioning software manual)

3) Make elevator stop at the middle floor.

4) Turn electric lock to position “ON”.

7.3. Power on and Inspection

7.3.1 Things need to confirm before Power On

1. Confirm all the air switches in control cabinet are open.

2. Confirm mode switch on the controller is at “inspection”, emergency stop button is pressed.

3. Confirm inspection switches on car top and cabin are both in “normal” positions.

4. Confirm terminal resistor for bottom HOP is connected

5. Check voltage on the main power supply: ： 3 phase voltage is 380±15%VAC, phase-phase voltage difference is smaller than 15VAC, Phase-N voltage is 220±7%VAC.

6. Confirm the wire specification and main switch capacity match the design requirement.

7.3.2 Inspection after Power On

1. Close main power switch Q1, if phase relay KXX green LED on, it means the phase sequence is correct, otherwise red LED on, means phase sequence is incorrect, in this case please switch off the main power switch, exchange any two phases, and repeat the above inspection.

2. Inspect the terminal voltage on transformer **TC1,** the values should be in the range of **±7%** of the indicated value, if voltage exceeds this range, find out the problem and correct it.

3. if the above inspections are normal, then do the following process:

   a. Switch on F4: Voltage between terminal 100-101 should be 110±7%VAC

Voltage between terminal 103-102 should be 110±7%VDC

   b. Switch on F5: Voltage between terminal 200-201 should be 220±7%VAC

   c. **(Note: Connect digital operator before power on)** After power on, first see if the main menu display is correct on LCD indicator. For example: elevator state, fault state, door lock state, current floor, running speed and else. In this way we can tell if the controller is working properly and whether 24V power supply is normal. Interface on digital operator LCD screen can be seen below in Figure 7.1.

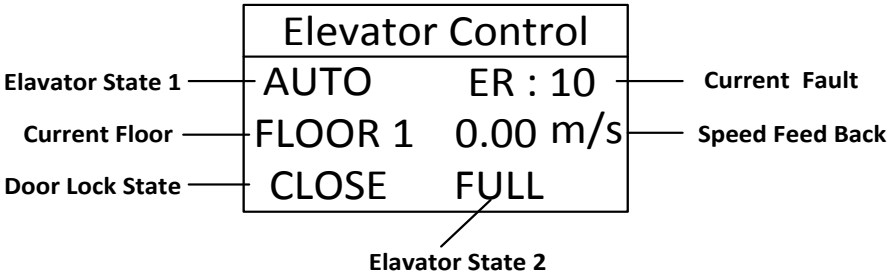


FIGURE 7.1 DIGITAL OPERATOR LCD SCREEN INTERFACE

   d. Terminal voltage of switch power supply unit:

Chart 7.1 Terminal Voltage for switch power supply unit

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

   e. After above inspections, do the following inspections:

   1) Check door lock circuit.

   2) Check leveling zone signal, top/bottom limit signal.

   3) Check electric lock, set the elevator auto-start/off time to "0', set electric lock switch to "ON", LCD screen will then display elevator state as "INSP", if set electric lock switch to "OFF", LCD screen will show "STOP".

4) Check door open/close system, do corresponded adjustment if necessary.

7.4. Parameter Setup

It is very important to set Parameters based on actual site condition, as this is the foundation for controller or control system to maximize its performance. For parameter setups please refer to chapter **4-6**. When setting parameters, please pay attention to the following points:

1. Set the motor basic parameters from motor nameplate namely motor parameter 1 content (F5 group). For example, motor type, pole numbers, rated frequency, rated power, rated RPM, rated current, Back-EMF (only for synchronous machine), no-load current (only for asynchronous machine), phase inductance, phase resistance and else. Amount which phase inductance, phase resistance and other parameters that are unknown can be acquired from motor -tuning; if system moment of inertia is unknown, leave it as default.

2. Set encoder parameter correctly (F8 group), for example encoder pulse, PG frequency division coefficient.

3. Set elevator running parameters correctly, such as motor rated RPM, encoder pulse (after frequency division.)

4. Set input type correctly, they should match the actual contactors, relays and hoistway contacts and switches.

7.5. Motor Initial Angle Tuning

For synchronous motor, it is necessary to perform motor initial angle tuning. Otherwise the machine cannot run normally, or even sever slip. Therefore, tuning initial angle is very important for synchronous machine. Before proceeding to load run, synchronous machine must first perform initial angle tuning successful and no load running successful. For the tuning procedures, please refer to Figure 7.3.

NS05 series villa lift cabinet supports static angle tuning.

For this tuning method, tuning can be carried out with steel rope attached, but please make sure the following procedures are finished correctly before tuning:

1. Wiring in control cabinet is completely correct, and system under inspection state;

2. Running parameter (F1), motor parameter (F5) and encoder parameter (F8) are set correctly;

3. All mechanical faults in hoistway have been eliminated; cabin and counterweight locate at center of the hoistway.

Set AutoTuneModeSel FC-13 (FX-20) to “1” on digital operator (0: rotation tuning, 1: static tuning), perform motor initial angle tuning according to the following procedures shown in Figure 7.2.

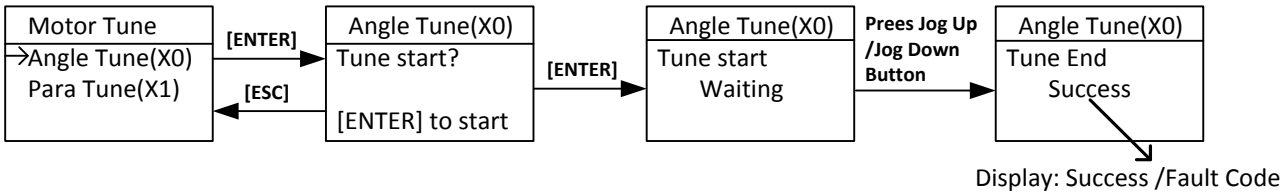


FIGURE 7.2 MOTOR INITIAL ANGLE STATIC TUNING

After pressing "Enter", tuning starts. When digital operator indicates "Waiting" , press jog up or down button ,Running contactor closes, motor will vibrate a little and give a noise, the duration depends on motor rated power and rated current, but no longer than 5s, this is static tuning period.(Make sure jog up or down button is pressed constantly, DO NOT release the button during this period.)Motor will then start and run in inspection speed, jog up or down, until digital operator indicates success, this is test running period. Finally, release the jog up or down button and finish the tuning procedure.

Please note the following items at motor static tuning:

3. To ensure safety, during tuning process, people is strictly forbidden to stay in car or hoistway;
4. Press up or down jogging button can base on the current cabin position;
3. The whole tuning procedures can be divided into two steps: static tuning and motor trial running, make sure there is no interruption between two steps. If no fault happens, before digital operator indicates success, press the jog up or down button constantly;
4. To achieve optimal control effect, it is recommended to repeat above tuning procedures 5 times, if the deflection of the results is small, take the average value.

If fault occurs in tuning, please refer to chapter 8 troubleshooting chart, locate the fault and solve it accordingly, then repeat tuning procedures.

7.6. Inspection Running

7.6.1 Inspection Running in Machine Room

1. Things to check before inspection running in machine room.

1) Inspection switch in control cabinet is at "Inspection" position, inspection switch on car top and cabin should be in "Normal" position.
2) Safety circuit and door interlock circuit work normal, DO NOT short door interlock circuit.
3) After power on, emergency stop contactor, door interlock contactor, and power contactor in control cabinet are closed, check if the controller works normal and parameter setting is correct, in LCD indicator, elevator state is "**INSP".**
4) Connect the brake wiring to control cabinet properly.

2. Inspection running in machine room

When the inspection running requirements in machine room are satisfied, press the Jog Up/Down button on the control cabinet, elevator will run up/down in set inspection speed.

Note: For integrated controller with ARD function, the inspection switch is called "Emergency Run Mode Switch"

7.6.2 Inspection Running on Car Top/Cabin

If inspection running in machine room works normal, then inspection running on car top and cabin can be performed. If the up or down direction of the buttons of inspection running on car top and cabin are opposite with the actual running direction, please inspect its buttons' wiring, do not change the wiring in control cabinet.

7.7. Hoistway Learning

Hoistway parameter self-learning means elevator runs at a self-learning speed and measures every floor height and record the position of every switch in the hoistway. As the floor position is the foundation for elevator normal running, braking and floor display. Therefore, before normal running, hoistway parameter self-learning must be performed. Before hoistway parameter self-learning, inspection running in full trip must be performed too; elevator must be able to run normally from bottom limit to top limit.

Hoistway parameter self-learning procedure is as follows:

1. Make sure elevator meets the conditions for safety running;
2. Make sure all the switches in hoistway are installed and connected correctly, traveling cable and hoistway cable are connected correctly, and finish setting the HOP/display address;
3. Elevator in inspection mode, jog elevator down to the bottom limit (bottom limit is valid);
4. Enter elevator hoistway self-learning menu through digital operator, follow the learning procedures shown below in Figure 7.3.

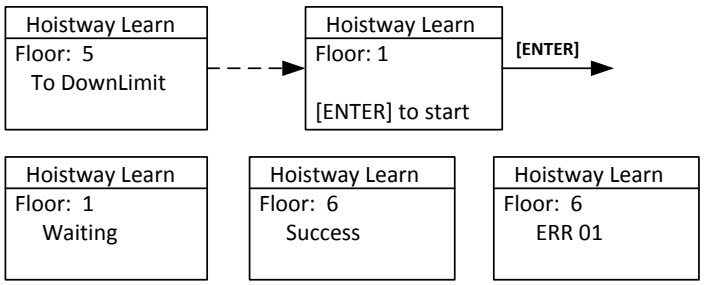


FIGURE 7.3 HOISTWAY PARAMETER SELF-LEARNING PROCEDURES

5. The results of learning can be seen from hoistway position parameter U00-U69 under monitor menu with unit of meter, please check the switches position after hoistway learning.
6. In self-learning process, if control system detects any abnormal phenomenon, self-learning will be terminated and give fault code, please refer to troubleshooting chart in chapter 8, find out the reason and solve it accordingly, then start hoistway parameter self-learning again.

IMPORTANT **When self-learning process stops, only when LCD indicator shows "success" on digital operator, self-learning is completed successfully.**

7.8. Normal Speed Running

After hoistway parameter self-learning is completed successfully, normal speed running can be carried out. Procedure as follows:

1. Switch elevator to attendant mode (Manual)
2. In floor selection parameter D0 through digital operator, target floor can be set (details refer to chapter **4.4 Commissioning Parameters Setup**). Then it is possible to perform single floor traveling, double floor traveling, multi-floor traveling and full trip traveling test. Through D1 parameter interface, input door open and close instruction to control the door.
3. Make sure elevator can start, accelerate, decelerate and leveling normally in normal speed running.
4. If running is abnormal, please check for parameters setting.

7.9. Elevator Comfort Level Adjustment

If comfort level and leveling accuracy of elevator running are not perfect, please follow procedures blow. First, check the mechanical system condition (Such as clearance of guide shoes, lubricating, steel rope, position of the rope hitch plate and else.) which might influence the comfort of elevator running. After checking all the mechanical parts, then do adjustment in controller.

As the controller control the motor running according to the given starting/braking speed curve, therefore shape of the given speed curve, motor feedback speed to controller and the timing logic of controller signals directly influence the comfort level of elevator running.

7.9.1 Adjustment for Start/Brake speed curve

Elevator running speed curve is shown below in Figure 7.4.

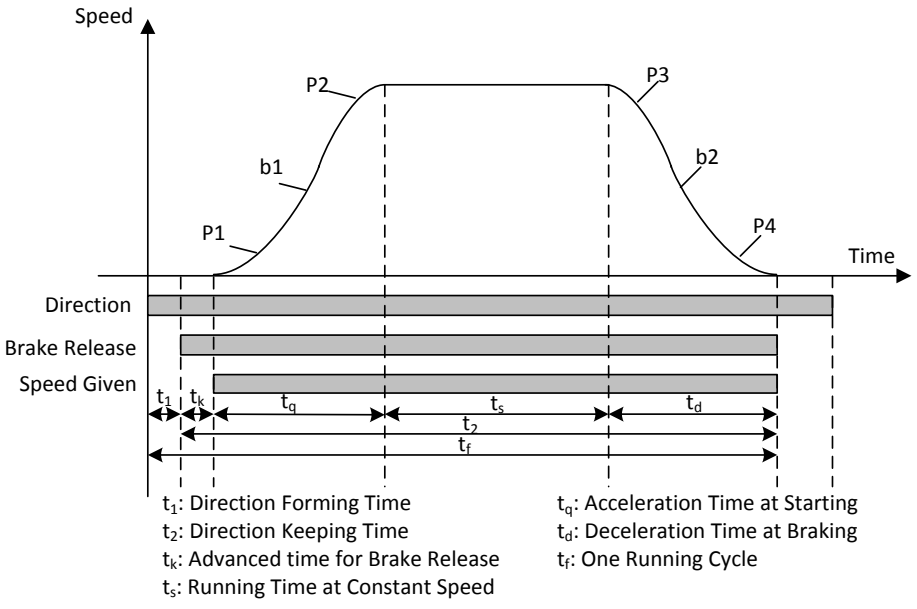


FIGURE 7.4 ELEVATOR RUNNING SPEED CURVE

1. Three parameters adjustment for motor starting S curve:

1) **P1**: Acceleration increase in starting section, it means the rate of elevator acceleration change. Smaller value means the slower starting section, the smoother running period and the lower the efficiency. On the other hand, faster at acceleration starting section means higher efficiency for elevator running.

2) **b1**: Acceleration in starting section, it means the rate of elevator speed change. Smaller value means the slower starting section, the smoother running period and the lower efficiency. On the other hand, faster at acceleration section means higher efficiency for elevator running.

3) **P2**: Acceleration decrease at end of starting section, it means the rate of elevator acceleration change. Smaller value means slower at end of starting section, the smoother running period and the lower efficiency. On the other hand, faster at acceleration ending section means higher efficiency for elevator running.

2. Three parameters adjustment for motor braking S curve:

1) **P3**: Deceleration increase at start of braking section, it means the rate of deceleration change, smaller value means slower at start of braking section is, smoother running period and lower efficiency. On the other hand, faster at brake starting section means higher efficiency for elevator running.

2) **b2**: Deceleration in braking section, it means the rate of elevator speed change. Smaller value means the slower braking section, the smoother running period and the lower efficiency. On the other hand, faster at braking section means higher efficiency for elevator running.

3) **P4**: Deceleration decrease at end of braking section, it means the rate of deceleration change. Smaller value means slower at end of braking section, smoother running period and the lower efficiency. On the other hand, faster at brake ending section means higher efficiency for elevator running.

Commissioning at jobsite need to first guarantee the elevator running efficiency, then adjust the above 6 parameters to achieve optimal elevator running curve.

7.9.2 Follow & Adjust Running Curve

To achieve the maximum level of comfort, integrated controller must control the motor and make feedback speed strictly following the change of running curve.

As the controller establishes the mathematic motor module based on the motor parameters input by customers, and controller perform decoupling control by this module on motor starting/braking. Therefore, customer should input the motor parameters correctly. (When motor parameter is not precise or not confirmed, we suggest customer perform motor parameter tuning.)

Proportional gain on the speed circle **F6-04** and integral gain **F6-05 or F7-05~F7-12** for PI section parameters also influence the motor tracking ability to speed curve. Generally, increasing the proportion gain will improve the reaction of the system and promote the tracking speed. However, if proportion gain is set too big, it will cause system vibration with high frequency and large motor noise. Increasing integral gain can improve the system anti-interference/tracking ability and improve the leveling precision but set integral gain too big will make system vibration, speed over adjustment and wave vibration.

Generally, it is recommended to first adjust the proportion gain, increase it right before system vibration threshold. Then adjust the integral gain, enable system with quick reaction and no over adjustment.

If system performance is not perfect at start or stop period (low speed period), try to control in multi-section PI, detail can be seen in 6.19.2 in **Chapter 6.**

7.9.3 Control Timing Adjustment

The control timing of this system can be seen Section **6.3** in **Chapter 6**, customer can adjust timing parameters and zero speed setting.

1. Timing adjustment: Refer to **section 6.3** Timing diagram under different state **in Chapter 6**.
2. Zero speed setting: This parameter is the threshold of zero speed. Main control board determines braking time by this value. If this value is too big, elevator will stop with speed, if too small it will delay door open after elevator stop.

Generally, for asynchronous motor, it is 5 RPM, for synchronous motor, it is 1 RPM.

7.10. Leveling Precision Adjustment

Leveling precision adjustment should be performed after comfort level adjustment is satisfied.

7.10.1 Basic Conditions for Elevator Leveling

1. Make sure the leveling switches and leveling inductor plates are installed in the right position.
2. Length of leveling inductor plates on every floor must be the same.
3. Leveling inductor plates must be installed vertically.
4. The position of leveling inductor plates should be precise. When elevator Is at the leveling position, the center of the plate and center of two inductors should match together (refer to **Appendix 2**), otherwise elevator leveling will have deflection, which means in up or down running, elevator stops higher or lower than leveling position.
5. If magnetic inductors are adopted, please make sure the inductor plates inserting to the inductor sufficiently, otherwise it will influence the reaction time of inductor, in that way elevator will overruns the leveling position.
6. To ensure precise leveling, system require elevator to crawl for a certain distance before stop.
7. In practice, first make adjustment for a middle floor, until leveling is precise. Then, adjust the other floors on the base of these parameters.

After adjusting curve selection, ratio and integral gain in the above context, please make sure every time elevator runs up or down, when stop at middle floor, its leveling positions are the same (each deflection of stop position ≤±2~3mm).

7.10.2 Leveling Parameter Adjustment

If elevator still cannot achieve desired leveling condition with adjustment based on instructions in section 7.9.1 in Chapter 7, further adjustments can be done by parameters. After elevator stops in normal running, if running speed

curve has no problem (for example, no sudden stop or overrun beyond leveling zone), if elevator overruns the leveling position (it stops higher in up-running, lower in down-running), please decrease leveling adjustment parameter F1-17 (default: 50). If elevator cannot reach the leveling position (It stops lower in up running, higher in down running), increase leveling adjustment parameter F1-17, generally the range of this parameter is 40~60, if the adjustment is too big, please adjust driving parameter PI, or the shape of speed curve (F1-10~F1-15).

7.11. Terminal Switch Position

Top and bottom terminal switch signal is used for elevator force deceleration and floor position calibration, it should be installed in the position where it is triggered when elevator is 1m ahead of top (bottom) leveling position (for **0.5m/s lift**). The position should be determined as follows:

1. Switch elevator to inspection mode.
2. Set the inspection speed to 0.3m/s, jog run up(down).
3. Stop elevator when top(bottom) switch is triggered.
4. Distance between car sill and landing door sill should be 1.0±0.1m.

For the positions of terminal switches under other speed elevator, please refer to the **Appendix I.**

Chapter 8 Troubleshooting

This chapter explains in detail the fault display of integrated controller, the reasons behind and possible solution. The fault display on integrated controller may come from elevator system errors, Hoistway learning errors, driver errors, motor parameters setting and Encoder phasing errors.

8.1. Elevator System Faults

Chart 8.1 Elevator System Fault List

Error Code	Definition	Possible Solution	Reset Level
Er2	Door inter-lock faults: Door inter-lock circuit open at elevator running	1. Check door interlock feedback signals X30,X31,X32 and close limit. After door interlock closed, these signals should be all ON. 2. Check door interlock and check if retiring cam has scratched door wheel. 3. Check if hall door closed securely and if door close limit keep valid. 4. Check hall door of each floor is fully closed, especially bottom floor. It may not close well because of airflow. 5. Check if there's Er37 at same time. If there's Er37, please deal with it as Er37.	D
Er3	Driver faults	Check driver fault code, find the cause of fault, and resolve it.	B
Er4	Elevator running in opposite direction with command	1. Exchange phase "V" and "W" on motor. 2. Exchange phase "A" and "B", on encoder terminal block or change in parameter setup.	B
Er5	1.Brake open fault: System output brake open but cannot receive feedback signal from brake monitor switches: After Y7, Y8 output, X11 and X16(brake relay feedback) has no feedback within 0.5 sec, or X15 and X19(Brake arm feedback) have no feedback within 2 sec.; 2. Brake close fault: System has not output brake open but it detects the feedback signal of brake travel switch: There's no Y7 output, but X11 or X16 or X15 or X19 is valid.	1. Elevator stop with brake closed, Y7 has no output. Under the status of brake closed, check input LED indicators of X11,X16,X15 and X19. If the indicator is OFF, please set related parameter in F3-00 to ON. If the indicator is ON, please set related parameter to OFF. For example, X11 and X16 LEDs are off, X15 and X19 LEDs are on, then set F3-00-11=ON, F3-00-16=ON, F3-00-15=OFF, F3-00-19=OFF; 2. In inspection mode, keep pressing both Up and Down button for more than 5 seconds to reset the fault. If the fault is not cleared, that means there's other fault in system and make fault code locked. Please save parameter and power off; 3. After totally power off(Segment display and status LEDs all turn off), power on system;	A

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er5	1.Brake open fault: System output brake open but cannot receive feedback signal from brake monitor switches：After Y7，Y8 output, X11 and X16(brake relay feedback) has no feedback within 0.5 sec, or X15 and X19(Brake arm feedback) have no feedback within 2 sec.； 2. Brake close fault: System has not output brake open but it detects the feedback signal of brake travel switch: There's no Y7 output, but X11 or X16 or X15 or X19 is valid.	4. After power on, Er05 should be reset. If there's still other fault, please solve it. If there's no other fault, please turn to inspection mode, run up or down, check if brake contactor turn on after Y7 output and if X11 and X16 LEDs have change (ex. Before it is off and now it turns on). Check if X15 and X19 LEDs has change after brake open(ex. Before it is lighted on and now it is off)； 5. If Y7 has output but brake contactor doesn't turn on, it means contactor control circuit has fault. If brake contactor turn on but X11 LED has no change, that means feedback signal of brake contactor is wrongly connected. If brake contactor turns on but brake is not open, please check brake power circuit. If brake is open but X15 or X19 LED has no change, please check brake travel switch wiring. 6.Check and recover above fault, then operate as step 2 to reset Er05 fault.	
Er6	During elevator running, leveling zone input signal X9, X10 is always on.	Check leveling zone signal circuit and induction switch	D
Er7	Encoder pulse not enough at elevator running.	Check the wiring from encoder to controller.	B
Er9	STO fault: Running output do not matching feedback signal: 1. After Y4 output, X17 has no feedback in 0.4s. 2. X17 is enabled when Y4 has no output.	1. When elevator stop, Y4 has no output, STO should have no action. If X17 is ON ,please check STO control circuit, wiring may be wrong. 2. STO has no action, check X17 LED on main board. If X17 is OFF, please set F3-00-17 to ON. 3. Inspection running. Y4 has output and STO act. If Y4 has output but X17 is OFF, please check STO control circuit and feedback circuit. 4.If all wiring are correct, please check if STO board is broken. 5. If all above errors are solved, Er09 should be automatically reset. But if there're 5 times of this fault continuously, it cannot automatically reset. Please save parameter and power off to reset it.	D/B
Er10	Safety circuit open, X29 input are invalid.	1. Check X29 LED on main board is ON or not. If X29 LED is off, that means safety circuit is open, please check which switch in safety circuit is open or wiring is wrong. 2. If X29 LED is ON, please ensure F3-00-29 is ON. 3. Ensure F4-06-11 is ON.	D
Er11	Leveling switch signal missing: Elevator is running pass the floor, but there is not input at X9 /X10.	Check the leveling switches and its wiring.	D

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er12	Elevator pass top limit switch	1. If elevator has moved out of leveling zone of top floor(exceed up leveling sensor position of top floor), please run down and make elevator no more higher than leveling zone of top floor. 2. If elevator hasn't exceed top floor, please check if X7(top slowdown) and up leveling signal X9 act or not. 3. If elevator is not at top slowdown position, please check X7 LED. If X7 is ON, please set F3-00-07 to OFF. If X7 is OFF, please set F3-00-07 to ON. After top slowdown switch act, X7 LED should have change. If X7 has no change please check top slowdown switch wiring.	D
Er13	Elevator pass bottom limit switch	1. If elevator has moved out of leveling zone of bottom floor (exceed down leveling sensor position of bottom floor), please run up and make elevator no more lower than leveling zone of bottom floor. 2. If elevator hasn't exceed bottom floor, please check if X8(bottom slowdown) and down leveling signal X10 act or not. 3. If elevator is not at bottom slowdown position, please check X8 LED. If X8 is ON, please set F3-00-08 to OFF. If X8 is OFF, please set F3-00-08 to ON. After bottom slowdown switch act, X8 LED should have change. If X8 has no change please check bottom slowdown switch wiring.	D
Er14	Floor position counter fault: After this fault, elevator will return to bottom or top floor slowly to correct position.	1.Check if F5 group motor parameters, F8 group encoder parameters and F1-00 rated speed, F1-01 motor RPM are setting correctly. If it doesn't match, please correct it. 2. Check encoder and related circuit if there's unstable connection. Make sure encoder shield cable connect to earth, and motor shield also need to connect to earth to reduce interfere. 3. Check if there's rope slide and repair it.; 4. Check if there's vibration on leveling sensor(X9 and X10) during running.; 5.Check if there's vibration on up/down terminal(X7 and X8); 6. After this fault, elevator will stop at nearest floor and then return to bottom or top floor slowing, then automatically recover.	D

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er17	No drive output after running command.	Check parameters in controller or contact supplier.	B
Er18	Floor counter fault: After this fault, elevator will return to bottom or top floor slowly to correct position.	1. It will show Er18 if elevator haven't done hoistway learning. Please turn to inspection mode and run to bottom limit, then complete hoistway learning. 2.Check encoder and related circuit, check earth connection; 3. Hoistway learning may be not precise, please learn it again.	C
Er19	The deceleration distance for target floor is not enough. Elevator did not perform hoistway parameter learning after changing terminal switch location.	1. Decrease "Least Speed" in user menu; 2. Do hoistway parameter learning again.	D
Er20	When elevator reaches top/bottom floor and get deceleration instruction, but elevator doesn't slow down; elevator did not perform hoistway parameter learning after changing terminal switch location.	1. Increase controller PI gain parameters; Check the braking resistor specification 2. Make elevator running curve smoother. 3. Do hoistway parameter learning again.	D
Er21	Single running overtime	1. Check motor parameters are setting correct or not. 2. Check F1 group parameter, F1-03 inspection speed, F1-05 rescue speed and F1-06 Least speed are set too low, then correct it. 3. Check if there's rope slide or car stuck status. 4.Check if F2-12 over Time is set too small, we suggest 45s; 5. Check leveling sensor is normal or not, if it has lost condition, please correct it. 6. After software version 7125, this fault must be reset by pressing both UP and Down for 5 sec in inspection mode.	A/B
Er22	Elevator has inspection signal input (X10 invalid) at elevator normal running.	Check inspection switch and related circuits.	D
Er23	One of two leveling switch (X9, X10) is invalid at elevator normal running.	Check leveling switches and wirings.	D
Er25	Heat sensor protection: Braking resistor or motor is over heat (X13 invalid).	1. Check heat sensor act or not and check its wiring. 2.If heat sensor has no action, please check X13 LED status. If LED is OFF, please set F3-00-23 to OFF. If X13 LED is ON, please set F3-00-23 to ON. 3. Set F3-02=13 to turn off this function.	D/B

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er26	Door inter-Lock error	1. Check if X31 and X30 status are same when door close and open. If different, please check related wiring. 2. If it is through door, please check if X32 and X30 are same. If different, please correct its wiring. 3. Check door close limit signal C06 and C04(Rear door) in U3-00. When car door close, C06 should be ON(or C04 should be ON when rear door close). When car door open, C06 should be OFF(or C04 should be OFF when rear door open). If there's no change, please check door close limit switch or its wiring. 4. If door close limit status is opposite from door interlock status, for example, car door is closed and C06 is OFF, or car door is open and C06 is ON. That means input type is reversed, please set F3-01-06 to ON. Same with C04.	D
Er27	Spared		D
Er28	Top/bottom terminal (1st or 2nd) switch fault. (X7 or X8 valid when elevator outside their floor)	Check for terminal switches location and their wirings.	D/C
Er29	Communication interference too much (In system or in duplex communication).	1. Check system ground condition. 2. Check COP/LOP for possible damage that may influence CAN BUS communication.	D
Er30	Door open fault (car cannot open door)	1. Run elevator in inspection mode, give door open command and check Y20 for output signal. 2. If Y20 has no output, need to check door open limit switch installation and input type. When door is closed, check C07 in U3-00, it should be OFF. When door is fully open, C07 should be ON. If C07 has no change, please check door open limit wiring. If C07 status is reversed, please set F3-01-07 to ON.	D/C
Er30	Door open fault (car cannot open door)	3. If Y20 has output but car door cannot open (No action), please check door driver wiring if door motor can act or not. 4. If Y20 has output but car door just open a little, then Y20 output cancel. Please check door open limit signal and ensure door open limit signal works normally. Then adjust F2-08 to extend door open output time. 5. Check door interlock. After car door open, door contactor should release or X30 LED should be OFF. If door circuit is not open, that means door circuit is shorted.	D/C
Er31	Door close fault (car cannot close door)	Normally due to door not installed properly and short circuit door interlock circuit. Check if door close and door interlock circuit are output at same time.	D
Er32	Floor number counting error.	A sudden power break may affect terminal/limit switches and cause floor number error. Elevator will then return to bottom floor for recalibration.	B

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er33	Motor star-sealed contactor fault: start-sealed output is different from feedback: 1. Y24 output but X22 has no feedback within 0.4 sec. 2. Y24 has no output but X22 is valid.	1.Check X22 status in U1-00 while elevator stop, the signal should be OFF. If X22 is light on, please check if there's short circuit between motor and earth, and check if the connection between power board and mainboard is normal. 2. If wiring is ok, no break circuit or short circuit but still error, please contact with factory. 3.If this fault happens for 5 times, it will not be automatically reset. It need to power off to reset the fault.	D/B
Er34	External 24V of power switch drop fault	Please check if 24V supplied by external switch power is connected normally. Sensor the voltage between D3-14 and D3-7 of mainboard. If system find the external voltage is lower than 16V, system will show fault. If voltage is too low, please check the reason of lack of voltage. If the 24V voltage is normal, please contact with factory.	D
Er35	System clock error	The circuit hardware on main board works abnormally, please contact with our factory.	B
Er36	Internal power +5V error	When system find the power of 5V is lower than 4.7V, this error occurs.	D
Er37	STO vibrate while brake opening	1. Check if STO vibrate during elevator running. 2. Check if X17 signal flicker during elevator running.	D
Er38	Star-sealed vibrate while brake opening	1. Check if star-sealed vibrate during elevator running. 2. Check if X22 signal flicker during elevator running..	D
Er39	Brake force detection fail, lack of brake force.	1. For gearless motor, the brake force is not enough, please adjust or replace brake; 2. This fault will not be reset by power off. Please keep pressing UP and DOWN button in inspection mode for 5 sec, then it can be reset. 3. Set F4-07-27 to OFF to disable brake force detection.	A
Er40	Brake invalid and car slide error	Safety protection function act. When system find the brake invalid, it controls the car creep around door zone to release passengers and then return to top floor and brake off again, but brake still fail to close. System announces brake invalid error and lock, will not recover until reset.	B
Er41	Unintended slide error, pay attention to brake force.	Safety protection function act. When system find the brake invalid, it controls the car creep around door zone to release passengers and try to brake off. During the creeping, the brake successful turn off. System record this slide error as a warning of brake force but not display error. You can see it in Fault Record.	B
Er42	While ARD mode, system find brake force invalid.	The car slides, system announces error and record it to prevent power of UPS drop too low during creeping. Unless it may cause unpredictable danger.	B
Er43	Safety protection function act, the car runs out of door zone while re-leveling and caused door circuit been cut off. System announce door zone missing and lock the error until reset.	Remind maintenance man to solve the problem of door zone missing. To prevent door zone missing happens as well as brake force invalid, or creeping will cause the car run out of safety range.	B

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er44	While safety protection function works, signal of up limit has vibrated.	Safety protection act, then car creep around door zone. While up creeping, the signal from up limit(X5) vibrated. System will record this error and lock the error until reset.	B
Er45	While safety protection function works, signal of down limit has vibrated.	Safety protection act, then car creep around door zone. While down creeping, the signal from down limit(X6) vibrated. System will record this error and lock the error until reset.	B
Er46	While safety protection function works, signal of up terminal has vibrated.	Safety protection act, then car creep around door zone. While up creeping, the signal from up terminal(X7) vibrated. System will record this error and lock the error until reset.	B
Er47	While safety protection function works, signal of down terminal has vibrated.	Safety protection act, then car creep around door zone. While down creeping, the signal from down terminal(X8) vibrated. System will record this error and lock the error until reset.	B
Er48	Parameters of safety protection function has been wrongly set.	Enable safety protection but disable open in advance & re-level function.	D
Er49	Miss safety door zone signals.	Enable safety protection but cannot find door zone signals at leveling position.	B
Er50	Elevator parameter setting unreasonable	1. Check if any floor in F4-00 is set to OFF, unstoppable floor, confirm if this floor is really unstoppable or not. If not, please set it to ON; 2. Check if F0-01 home floor is set to unstoppable floor in F4-00, please set it to stoppable floor; 3. Check if F0-02 fire floor is set to unstoppable floor in F4-00, please set it to stoppable floor; 4. Check if F0-03 parking floor is set to unstoppable floor in F4-00, please set it to stoppable floor; 5. Check F4-04 and F4-05 if both front and rear door are set to OFF for one floor. Please set the side with available door to ON; 6.Check if F1-25 duplex and F1-26 group are both set to 1. If it is not used, please set to 0.	D
Er51	Drive module overheat protection.	When running, drive module met overheat protection. Elevator stopped at nearest floor.	D
Er52	The up and down door zone signals are opposite.	Exchange up and down door zone signal wires.	C
Er54	light curtain obstructs error and car slows down to stop.	Light curtain is active during car running, check whether the light curtain signal is normal.	B
Er56	Door close limit abnormal error	1. When F4-06-16 = ON, or system is in door lock bypass operation, the door close limit is constantly inactive; 2. When system is in automatic mode and elevator is in leveling position, or when system is in inspection mode. The door lock is open, but door close limit is constantly active; 3. Please check whether the door close limit signal and car signals are correct.	D
Er57	CAN communication abnormal error	Car top communication lose for modular system. Or when F4-06-22=ON, pit inspection board communication loses. Check whether car top board and pit inspection board are working properly.	C/D

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er58	The ARD power supply 24V is abnormal	1. Input power supply of detection system. 2. Check the ARD wiring.	B
Er60	Spared		A
Er64	ARD car slip zero speed overtime	Brutal drive elevator, when in ARD car slip self-rescue operation, system open the brake, but car is not moving in 2 seconds. Please check if the cabin or the brake is jammed. No brutal drive elevator, please check whether special function F4-07-00 is accidently enabled.	C
Er65	ARD car slip over speed	Brutal drive elevator, when in ARD car slip self-rescue operation, the car slipping speed is over 0.3m/s, please check whether the star-sealed contactor is working properly, or the encoder feedback is correct.	C
Er66	ARD sliding operation timeout	For the forced drive elevator, the ARD car sliding self rescue operation lasted more than 150s, and the leveling position was not found. Please check whether the leveling signal is normal.	C
Er68	Magnetic dipstick fault	Magnetic tape or control board is abnormal.	C
Er70*	Power abnormal	1. Please check power input, 3-phase power input or neutral input may lost. If it is 200V cabinet and only has L and N2 inputs, please set FX-43=1. 2. Power contactor feedback X6 is abnormal. X6 LED should be ON, please check its wiring and make sure F3-00-06 is ON. 3. Check F3-02~F3-04 spared input parameters, make sure none of them are set to 21 or 22. If yes, please change it. 4. Check sub code of fault record. If sub code is 2 or 7, please contact with factory.	D
Er88	Terminal missing located in the top door area, but the top terminal input is invalid.	For the system that omit the top and bottom limit, the terminal signal is used to determine whether the elevator is running over limit with the door area signal combination. Therefore, if the elevator stops at the top floor, if the top terminal fault is not detected, please check the top terminal switch.	C
Er89	Terminal missing located in the bottom door area, but the bottom terminal input is invalid.	For the system that omit the top and bottom limit, the terminal signal is used to determine whether the elevator is running over limit with the door area signal combination. Therefore, if the elevator stops at the bottom floor, if the bottom terminal fault is not detected, please check the bottom terminal switch.	C
Er90	When the bypass is running, door-open completely signal and door-close completely signal is effective at the same time.	When the bypass is used in the inspection mode, the system detects door-close completely switch. If the door-open completely signal and door-close completely signal are effective at the same time, which indicates that the user has no connection or reversed the input type, **so** the system reported failure to prompt the user to connect wire, Otherwise, we cannot confirm whether the car door is properly closed.	C

Chart 8.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution	Reset Level
Er91	The bypass operation signal of the door lock loop is detected fault.	Automatic operation is resumed, but bypass switch is not disconnected. Bypass check point X6 is effective. Check whether the bypass board plug-in is not restored or detect X6 input type.	C/D
Er92	Spared		C
Er93	Spared.		C
Er94	Pb parameters of S curve is unreasonable, deceleration distance is too long, it may not be able to stop while single floor running and stop at next stop.	1. Change bp parameter of curve; 2. Increase F1-10 and F1-11 but do not exceed 0.7; 3. Increase F1-12~F1-15 but do not exceed 0.7.	D
Er95	During the single start operation, when the contactor is pulled in, the rear door Interlock loop jitter exceeds 20 times, and the door lock loop is abnormal.	Please check the door lock loop, there may be a virtual connection.	B
Er96	The protocol binding of COP and LOP don't match the controller's, cannot operate car call and hall call.	1. Release binding by setting FX-42=0, it will also reset fault. If you need binding function, please start binding again; 2. Re-binding. Firstly set FX-42=0 then set FX-42 =No. (new binding code) and save parameter.	D
Er97	Minimum curve deceleration speed is less than the length of floor plate, it may cause single floor running unstoppable.	1. Increase F1-06 Least speed. 2. Slightly increase F1-10~F1-11.	D
Er98	Drive program locked	Please contact with supplier.	D
Er99	Logic program locked.	Please contact with supplier.	D

Note:

1. Elevator fault reset conditions

Reset level	Fault reset conditions
A	In inspection mode, press both Up and Down for 5 sec to reset. (need professional to manually reset at site)
B	Power off control system and power on again
C	Turn to inspection mode
D	Automatically reset

2. In reset level, the level of A,B,C,D reduce in order. The reset way of A can only reset faults in reset A type. The reset way of B can reset faults in reset B,C,D types. The reset way C can reset faults in C and D types.

3.Adding sub code in fault records: C0, C0=0 fault has no sub code, C0≠ fault has sub code(fault in chart 8.1with *).

4. In default setting, it shows fault code when fault occurs, but not show sub code. During fault looping display, press UP button, it will show corresponding sub code, press ESC to exit sub code show. For example, fault Er02, the sub code is 5. When there's fault, it shows E-02, after pressing UP button, it shows E02.5, press ESC to exit.

5. In case of ARD or battery failure, the nixie tube will alternately display b-EE (battery failure)<->F-01 (floor display). See Appendix 5 for details Description of ARD and electric release power failure emergency rescue function.

6.Sub code of fault explanation

Fault	Sub code	Analysis
Er2 Door interlock fault: Door circuit open during elevator running.	1	Car door open（X31）
	2	Hall door open（X30+X32）
	3	Rear car door open（X30）
	4	Door contactor turn off
	5	Running contactor turn off
	6	During door bypass running, door close limit is invalid
	7	Safety circuit open
	8	Door interlock or running contactor vibrate
Er5 Brake feedback fault: This fault cannot be reset by power off, it need to press both Up and Down in inspection mode for 5 sec to reset it	1	Brake contactor has no action during brake open or feedback signal X11 or X16 lost.
	2	When brake off, brake contactor adhered or feedback X11 and X16 keep valid.
	3	When brake off, X15 travel switch feedback signal is valid.
	4	When brake off, X19 travel switch feedback signal is valid.
	5	When brake off, both X15 and X19 travel switch feedback signal are valid
	6	When brake on, X15 travel switch feedback is always invalid.
	7	When brake on, X19 travel switch feedback is always invalid.
	8	When brake on, X15 and X19 travel switch feedbacks are always invalid.
Er9 Running contactor action Abnormal	1	Y4 running enable has no output but X17 STO feedback is abnormally valid
	2	Y4 running enable has output but X17 STO feedback is abnormally invalid
Er10 Safety circuit open，X13、X29 input invalid	1	Safety circuit open
	2	Safety contactor off
Er11 Leveling signal lost fault	1	Elevator has run over floor distance but leveling signal X9 and X10 keep invalid.
	2	There's two leveling in car top communication but leveling signal X9 and X10 keep invalid.
Er12 Exceed top limit	1	Soft limit type, up terminal X7 is valid and run out of up leveling sensor.
Er13 Exceed bottom limit	1	Soft limit type, down terminal X8 is valid and run out of down leveling sensor
Er17 After running command, no drive output	1	Controller runs but no running feedback from inverter.
	2	Controller doesn't run but inverter has running feedback.
Er23 One of leveling signal keeps invalid during running	1	After running bypass a floor, X9 keeps invalid.
	2	After running bypass a floor, X10 keeps invalid
Er26 Door fault	1	X31 and X30 are not matched
	2	X32 and X30 are not matched
	3	F4-06-16=ON, but it find no close limit after door closed
	4	Through door elevator but haven't set F4-06-04=ON
Er28 Up/down terminal or up/down 2nd terminal ad hered(X7 or X8 is valid at the floor which is not installed.)	1	Down terminal becomes valid but not at bottom floor
	2	Up terminal becomes valid but not at top floor

Fault	Sub code	Analysis
Er30 Door open fault	Null	Door motor fault. After receiving open command, motor has no action
		Car top board fault, open command is not output
		The wiring from car top board to door motor has fault
Er31 Door close fault	Null	Door close limit is valid but door circuit is not closed
		Door close ends, but X31 hall door has no feedback signal
		Door close ends, but X32 hall door has no feedback signal.
		Door close ends, but X30 door lock has no feedback signal.
		Door close ends, but no close limit feedback signal
Er33 Star-sealed contactor fault	1	Y24 star-sealed contactor has no output, but X22 has feedback
	2	Y24 star-sealed contactor has output but X22 has no feedback
Er34 External switch power 24V drop	Null	Sensor the voltage between J6-1 and J6-2 by multi-meter. If the voltage is lower than 16V, system will show fault
		If the voltage is too low, please check the reason of lack of voltage in external power
		If 24V is normal, please contact with factory
Er39 Brake force detection fail, lack of brake force	1	Find motor has moved
	2	Find motor has feedback speed
	3	Find movement of motor wheel
Er68 Magnetic dipstick fault	1	Loss of sensor communication
	2	Magnetic tape control board hoistway data is abnormal
	3	Sensor fault
	4	Hardware failure
	5	Overspeed
	6	Control board communication disconnected
	7	Over limit
Er70 Power abnormal	1	In ARD status, power contactor feedback X6 is abnormally valid.
	2	Status abnormal, it enters to ARD status while doing electric brake release.
	3	Input power abnormal, 3-phase input power detection X20 or Neutral detection X21 is abnormal
	4	Power contactor feedback X6 is cut off abnormally
	5	When ARD rescue, communication of power board lost
	6	When electric brake release, power contactor feedback X6 is valid abnormally.
	7	Status abnormal, when ARD rescue, it enters to electric brake release status.

8.2. Hoistway Parameter Self-Learning Faults

Chart 8.2 Hoistway Parameter Self-Learning Fault List

Error Code	Definition	Possible Solution
LER0	System running error	Press "ESC" to exit learning, check fault record shown in Chart 8.1
LER1	Pulse input phase reverse	Exchange phase A and phase B in encoder.
LER2	Bottom terminal 1 switch input repeat.	Bottom terminal 1 switch installation error, causing multiple terminal switch input or bottom terminal 1 switch signal shake. Check related switches.
LER3	Bottom terminal 1 switch signal lost (elevator >2.0m/s)	Bottom terminal 2 switch enable before bottom terminal 1 switch or bottom terminal 1 switch signal lost. Check related switches.

Chart 8.2 Hoistway Parameter Self-Learning Fault List (Cont'd)

Error Code	Definition	Possible Solution
LER3	Bottom terminal 1 switch signal lost (elevator >2.0m/s)	Bottom terminal 2 switch enable before bottom terminal 1 switch or bottom terminal 1 switch signal lost. Check related switches.
LER4	Bottom terminal 2 switch signal repeat. (elevator >2.0m/s)	Bottom terminal 2 switch installation error, causing multiple terminal switch input or bottom terminal 2 switch signal shake. Check related switches.
LER5	Bottom terminal 2 switch signal lost (elevator >2.0m/s)	Top terminal 2 switch enable before bottom terminal 2 switch or bottom terminal 2 switch signal lost.
LER6	Top terminal 2 switch signal repeat. (elevator >2.0m/s)	Top terminal 2 switch installation error, causing multiple terminal switch input or top terminal 2 switch signal shake. Check related switches.
LER8	Top terminal 2 switch signal lost (elevator >2.0m/s)	Top terminal 1 switch enable before top terminal 2 switch or top terminal 2 switch signal lost.
LER9	Bottom terminal 1 switch signal lost	Top terminal 1 switch enable before bottom terminal 1 switch or bottom terminal 1 switch signal lost.
LER10	Top terminal 1 switch signal repeat	Top terminal 1 switch installation error, causing multiple terminal switch input or top terminal 1 switch signal shake. Check related switches.
LER11	Top terminal 1 switch signal lost	Top limit switch enables before top terminal 1 switch or top terminal 1 switch signal lost.
LER12	Total floor setting error	Check total floor number match actual floor number. Check leveling inductor plates on every floor.
LER14	Two leveling inductors cannot trigger together	Leveling inductor plate on this floor cannot cover both inductors or missing one leveling inductor.
LER15	Press "ESC" in the middle of hoistway parameter learning process.	Cancel the learning by pressing "ESC".
LER17	Up/Down leveling switch enable at same time	Wiring of two switches is parallel connection by mistake, or bottom limit switch is installed close to 1st floor leveling position.
LER18	Hoistway data saving error	▲Please contact supplier at once.
LER19	Both leveling switch signal enable together when arrive at top limit switch.	Move up top limit switch.
LER20	Bottom limit switch too high	Lower the bottom limit switch.
LER21	When elevator reaches top limit switch, bottom terminal 1/2 switch is valid.	Check the switches position and their wirings.
LER22	When elevator start from bottom limit switch, top terminal 1/2 switch is valid.	Check the switches position and their wirings.
LER23	No pulse feedback after starting.	Check the wire of PG card.
LER24 （25）	The up and down door zone signals are opposite in hoistway learning.	Check installation position of up and down door zone sensor, exchange their wires.
LER26	Reverse connection protection of leveling and door area signals.	1. Check whether the car roof door area signal (MQ2) and car roof leveling signal (MQ1) are connected reversely. After adjustment, the system is powered off and re powered on for hoistway self-learning; 2. If the door area signals are correct and the communication interference and delay are too large, the MQ2 door area signals will be removed, the hoistway self-learning will be done again, and MQ2 will be connected after self-learning.
LER30	The elevator is not at the lower limit during hoistway self-learning.	Overhaul, turn the elevator to the lower limit, and then conduct shaft self-learning.

Note: System has 2 top and 2 bottom terminal switches for elevator speed >2.0m/s.

8.3. Driver Faults

Chart 8.3 Driver Fault List

Error Code	Display	Definition	Possible Causes	Possible Solution
DF1	UV	**DC bus under voltage** (for 400V drive, 380V at UV protection; for 200V drive, 220V at UV protection)	1. Phase lost on input supply; 2. Instantaneous power lost; 3. Excessive input voltage fluctuation; 4. Loose terminals at input; 5. Surge Resistance didn't release; 6. UPS running, but X18 is in valid.	1. UV error after power ON; Check input power supply; Check input power cable terminals; Check cable between main board and power board; 2. Without load, up running is normal, but down running shows UV error, Check surge resistance; 3. UV error while ARD running, Check X18 connection; 4. UV error after power off. This is normal condition, system record each time of power off by UV error.
DF2	OV	**DC bus over voltage** (for 400V drive, 760V at OV protection; for 200V drive, 410V at UV protection)	1. Too short deceleration time; 2. Brake resistance value mismatch; 3. Supply voltage too high; 4. No connection to braking resistor or abnormal braking resistor or lack of capacity.	1. Increase deceleration time; 2. Connect capacity and connection of brake resistor; 3. Check power supply.
DF3	OH	**Heat sink overheated** Find temperature of module is higher than a preset value and keep for certain time; Find temperature of module is lower than zero degree and keep for certain time;	1. Excessively ambient temperature; 2. Damaged cooling fan; 3. Existence of heat source around; 4. Ambient temperature is below zero degree; 5. Bad connection between main board and power board.	1. Reduce ambient temperature; 2. Remove heat source around; 3. Check the fan and wiring; 4. Set FX-21 to OFF (disable minus temperature warning); 5. Check cable between main board and power board.
DF4	IF	**IPM fault** Find drive module has serious short circuit error, system trigger a hardware over-current protection. Please get rid of external short circuit before retrying	1. IPM over current/short circuit; 2. IPM over heat; 3. Abnormal IPM control power (UV); 4. Motor wire adhered or short to ground; 5. Abnormal star-sealed contactor action.	1. Check output short circuit; 2. Check motor short circuit; 3. Check star-sealed contactor action; 4. Contact with supplier.

Chart 8.3 Driver Fault List (Cont'd)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF5	OC	**Overcurrent** Phase current of controller has exceeded limit and keep for certain time	1. Inverter output short circuit; 2. Machine over-load; 3. Accel/decel time too short; 4. Encoder signals have a bad connection; 5. Wrong motor or encoder parameter setting: (1)Wrong original point (Gearless); (2)Rated slip is too large (Geared); (3)Wrong poles setting; (4)Wrong encode pulse setting; (5)Wrong P & I parameter setting.	1. Check motor short circuit; 2. Check accel/decel time, slow down if needed; 3. Check if inverter's capacity match load; 4. Check encoder connection: (1) Check original point (Gear less); (2) Check rated slip (Geared); (3) Check poles setting; (4) Check encoder pulse setting; (5) Check P & I parameter setting.
DF6	CF	**CPU faults** Controller abnormal	Electro-Magnetic interference.	Too much interference.
DF7	OS	**Elevator over speed** the speed feedback exceeds the speed limit and last longer than set time.	1. Max speed /last time set incorrect; 2. Speed over-tuning; 3. Encoder feedback incorrect; 4. Wrong motor parameters setting.	1. Check speed limit setting; 2. Check the P/I parameter; 3. Check encoder; 4. Check motor parameters.
DF8	OE	**Speed over deviation** the speed deviation exceeds the allowable range(F9-03) and last longer than set time.	1. System overload; 2. Accel/decel time short; 3. Parameter setting wrong; 4. Encoder cannot work properly; 5. Brake wrongly act; 6. Wrong allowable range set.	1. reduce system load; 2. Increase accel/decel time; 3. Check the parameters; 4. Check the encoder; 5. Exchange motor phase sequence or exchange A+/A- and B+/B- wire; 6. Check brake action.

Chart 8.3 Driver Fault List (Cont'd)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF9	PGO	**PG disconnects** Did not receive encoder signal at operation. PG card type setting is different with actual one, system cannot identify it.	1. Encoder wiring break, loosen or wrong connection; 2. Encoder damaged; 3. Wrong PG type setting; 4. PG card damaged; 5. Brake not open.	1. check encoder wiring; 2. Check encoder; 3. Check if F8-02 PG type is same with actual PG card; 4. Check connection between PG card and main board; 5. Check if brake can open; 6. If software version is old, please enter Fault report->Controller Fault, and find E2, E3 value: Incremental encoder: (1)E3=35, no speed feedback; (2)E2=16, U/V/W signals error; Sin/Cos encoder: (1)E3=35, no speed feedback; (2)E3=29,31,36, abnormal communication between main board and SPG card; (3)E3=28 or 34, C/D signal error; (4)E3=32 or 33, A/B/C/D signals are highly similar; 7. If software version is new, these errors are DF18, DF19 and DF20.
DF10	FF	**Flash memory fault**	Data fault at saving parameters.	Please contact supplier.
DF11	BF	**Base lock circuit error** When system find baselock valid and receive running command, but running condition isn't ready.	1. Wiring for baselock at X14 is incorrect; 2. Setting electric level for baselock at X14 is incorrect.	1. Check the wiring at X14; 2. Modify the parameters.
DF12	OL	**Motor overload** current output exceed 150% (200%) rated value for 60s (10s). Motor current exceed 150% (200%) rated value for 60s (10s).	1. System load too heavy; 2. System power rating too low; 3. Low capacity controller.	1. Reduce system load; 2. Change a more suitable controller; 3. Change motor or increase F5-08 rated current properly to promote overload capacity.

Chart 8.3 Driver Fault List (Cont'd)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF13	MC	**MC contactor bad action** Controller main contactor MC does not close after given close command for set time.	1. Wrong wiring for MC contactor; 2. MC contactor damaged; 3. Wrong FX-23 surge feed back type setting; 4. Drive power on power board is abnormal.	1. Try to reset the power, if this error come again, contact supplier for replacement; 2. Change FX-23 status, then power off and power on again.
DF14	BR	**Brake unit fault** While system find DC bus voltage reach braking range, but braking tube keep open and last over preset time.	1. defective brake cable or damaged brake elements or IGBT module; 2. External brake resistor disconnected or not connected; 3. Bad connection between the main board and the power board.	1. Check brake resistor; 2. Replace the controller; 3. Check the main board and the power board connector.
DF15	OF	**Output phase lost** System find phase lost or break, running condition is not ready	1. Output cable break or lose terminal; 2. Motor stator cable disconnect.	1. Check output cable/terminal; 2. Check motor stator cable; 3. Set FD-21. BIT2 to 1 to disable this detection.
DF16	SCF	**Output current remains at elevator stop** After the system executes the stop instruction, the output current is not zero and the preset time is kept.	1. Controller damaged; 2. Cabinet works abnormally.	1. Change the controller; 2. Check cabinet wiring.
DF17	SRF	**Elevator slips after stop** After the system executes the stop command, the encoder's feedback speed is not zero.	1. Brake/encoder loose; 2. Encoder interference.	1. Fasten brake/encoder; 2. Remove interference source.
DF18	UF	Incremental: **Signal U of encoder wire lost** Sin/Cos: **Signal C and D abnormal**	1. Encoder damaged or wiring incorrect; 2. Wrong PG type setting.	1. Check encoder and wirings; 2. Correct PG type setting.
DF19	VF	Incremental: **Signal V of encoder lost** Sin/Cos: **A, B, C, D signals are highly similar**	1. Encoder damaged or wiring incorrect; 2. Wrong PG type setting.	1. Check encoder and wirings; 2. Correct PG type setting.

Chart 8.3 Driver Fault List (Cont'd)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF20	WF	Incremental: **Signal W of encoder wire lost** Sin/Cos: **Abnormal communication between SPG card and main board**	1. Encoder damaged or wiring incorrect; 2. Wrong PG type setting; 3. Bad connection betwe en the main board an d the PG card.	1. Check encoder and wirings; 2. Correct PG type setting; 3. Check whether the PG card is fastened to the main board.
DF21	DF	**Parameter setting error** System find rated current/no-load current/ rated slip/ poles/pulse setting error.	Parameter setting error Check rated current/no-load current/ rated slip/ poles/pulse setting.	Check parameter setting.
DF22	SDF	**Internal programmer self-check error** The system detected the types of faults that cannot be classified into routine fault types.	Internal data setting error.	Please contact with supplier.
DF23	150	**Current collection sensor error** When the elevator starts, the system detected that the instantaneous current value of the current sensor is not near the zero point.	1. Bad contact between main board and drive power; 2. Hardware error.	1. Please with contact supplier; 2. Check the main board and driver power board connection.
DF24	151	**Overtime at zero speed** The system has detected that the elevator controller has been given a zero-speed state and exceeds the zero-speed timeout time.	Drive controller keep too long time under zero speed.	Check if inspection speed or rated speed is reasonable.
DF25	152	**Baselock error** System detect baselock signal and cannot reset error	1. Bad contact among chips on mainboard; 2. Bad contact among main board and power board.	1. Check the connection between; Bad contact among chips on mainboard; 2. main board and power cable. Replace main board.
DF26	153	**Sequence of load compensation is abnormal** When the load compensation device starts, the system detects the rotation of the motor.	While drive controller operate load compensation, the sequence is abnormal. Or brake open time is too short.	Check the brake and if Brake ON Time setting is too short.

Chart 8.3 Driver Fault List (Cont'd)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF27	154	**Angle tuning fail** Angle tuning with load not completed.	Angle tuning fail with fault.	Solve angle tuning fault first, then do it again. **Attention: Don't run elevator without successful auto tuning, or it will lose control.**
DF28	155	**Internal communication error** The system has detected the abnormal communication in the main board.	1. Internal communication between controllers is abnormal; 2. Component on mainboard is abnormal; 3. Elevator controller gives wrong commands.	1. Check if there is serious EMI or contact with supplier; 2. Change the main board.
DF29	156	**The running mode of machine is abnormal** speed source selection F9-01 cannot match current logic.	Speed source selection F9-01 do not adapt to current control logic.	When normal running, confirm F9-01=2.
DF30	157	**Power of bottom case identification error** The main board cannot correctly identify the bottom case configuration information.	1. Connection between main board and power drive board is bad; 2. Component on mainboard is abnormal; 3. Component on power drive board is abnormal.	1. Check the connection between main board and drive power; 2. Change main board; 3. Change power board.
DF31	158	**Communication error between drive modules** Detection of communication error between drive modules	Communication of internal drive chip is abnormal.	1. Check if there is serious EMI or contact with supplier; 2. Change main board.
DF32	159	**Encoder Z (or R) signal is abnormal** Motor has run for over 2 rounds but didn't find Z signal.	1. The controller finds disconnection or interference in Z pulse; 2. Component on mainboard is abnormal; 3. Component on PG card is abnormal.	Check if there is interference or broken wire of Z pulse.
DF33	160	**Before start, feedback speed is abnormal.** Before elevator start, system find the feedback speed is over limit.	1. Encoder signal anomaly; 2. Brake force may be not enough or already open.	1. Check A & B signals of encoder; 2. Check brake.

Chart 8.3 Driver Fault List (Cont'd)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF34	161	**While brake force detecting, feedback movement of encoder is too long.**	1. Encoder feedback signal anomaly; 2. Brake force may be not enough or already open.	Check the brake and encoder.
DF35	162	**While safety protecting, motor has crept too long** When the system is in the state of security protection, it is detected that the encoder feedback displacement is too large.	1. Encoder feedback signal anomaly; 2. Brake force may be not enough or already open. 3. The setting of control parameter is not reasonable.	Check the brake, encoder and parameter setting related to safety protection
DF36	163	**Lack of phase protection for 3-phase input power** During the operation of the system, the input phase is detected lack, and the shell driving power is abnormal.	1. While running, system find lack of phase. 2. Check if there's IF error in Fault report. If yes, solve error according to IF error. 3. Bad contact between main board and power board.	1. Check 3-phase input power; 2. Check if there's short circuit of output 3-phase; 3. Check cable between main board and power board; 4. While using one phase, set FD-21. BIT0=1 to ignore lack of phase error.
DF37	164	**Three-phase output line short circuit** Short circuit between 3-phase output or short to earth or to N line.	1. There is short circuit among 3-phase output or output to earth or output to N line; 2. Imbalance adapt between motor and inverter capacity.	1. Check 3-phase output and output to earth and output to N line; 2. Check if inverter capacity adapts to motor. **Note: Set FD-21. BIT3=1 can ignore this error, but we don't suggest doing that. Because it has risk to burn module.**
DF38	165	**Imbalance of 3-phase output** System find the summation of 3-phase current is not zero and last for certain time.	1. The output current feedback way of 3-phase output is seriously abnormal; 2. One of 3-phase may short to earth or N line.	1. Check if there is broken circuit or short circuit with N(Neutral) of 3-phase output; 2. Feedback channel of current sensor.
DF39	166	**Output voltage is saturated** During the operation of the system, the integrated controller output voltage is detected to be saturated.	1. Low input voltage; 2. Rated motor speed setting is not same with actual speed; 3. For geared motor, rated slip is too low or over load.	1. Check DC bus voltage; 2. Check if rated RPM is same with nameplate or if bus voltage has been dropped down through monitoring running status; 3. Check rated slip for geared motor; 4. Check balance factor.

8.4. Motor Initial Angle Tuning Faults

Chart 8.4 Motor Initial Angle Rotation Tuning Fault List

Error Code	Definition	Possible Causes	Possible Solution
RF100	**Controller fault** The drive has a failure and cannot do Initial Angle Rotation Tuning.	Controller has met fault.	First solve fault according to error code, then angle tuning again. Refer to **Chart 8.3 Driver Fault List.**
RF226	**Give voltage limit** Already give limit force during angle tuning, but feedback current cannot reach least requirement.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far less than the drive).	1. Check parameters of motor and encoder; 2. Decrease F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF227	**Output current over limit** During the tuning process, the driver controller detects that the output current has reached the limit and stops the output, indicating that the current is out of limit.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far more than the drive).	1. Check parameters of motor and encoder; 2. Increase F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF228	**ESC input** During the tuning process, ESC input is effective, and self-tuning is cancelled.	The hand operator triggers the ESC button to cancel angle tuning.	Angle tuning interruption, failure to complete, please do angle tuning again.
RF229	**Over time at zero speed** In the process of tuning, when the rotor is positioned, the feedback speed is not zero for a long time, and it cannot locate accurately.	1. Motor carrying partial load; 2. Bad feedback speed of encoder.	1. Ensure brake is off; 2. Remove interference of encoder.

Chart 8.4 Motor Initial Angle Rotation Tuning Fault List (Cont'd)

Error Code	Definition	Possible Causes	Possible Solution
RF230	**Current detection error** During the tuning process, the feedback current value ultra-lower limit and the self-tuning condition is not satisfied.	1. Broken circuit at load side or lack of phase; 2. Imbalance phase of motor side or rated current wrongly set; 3. Inverter cannot adapt to motor. (Motor capacity is highly lower than inverter)	1. Ensure 3-phase connection to motor; 2. Ensure motor parameters setting; 3. Ensure motor should adapt to inverter.
RF231	**CD signals of encoder is abnormal** In the process of tuning, it is found that CD feedback position value is abnormal, and it is impossible to identify the CD line sequence.	1. Parameters of motor or encoder have been wrongly input; 2. Interference in encoder; 3. Error input of motor or encoder; 4. Wrong PG type set.	1. Check CD signals wiring; 2. Remove interference; 3. Verify parameters of motor and encoder; 4. Check PG type set.
RF232	**Motor does not rotate** In the process of tuning, the driver cannot control the normal rotation of the motor.	1. Encoder connection fault, no feedback speed; 2. Motor has load or brake close; 3. The power difference between the motor and the driver is too large and does not match.	1. Check encoder A&B signal connection, elimination of encoder signal interference; 2. Make sure motor has no load & brake open; 3. Check the parameters of the number of the motor and the number of the encoder; 4. Detection of power matching of motor and driver controller, reduce the rated current [F5-08], and resume F5-08 after tuning.
RF233	**Motor rotates in wrong direction** In the process of tuning, the direction of the motor is not consistent with the control direction, and there is a reverse rotation.	Motor phase sequences does not match encoder.	1. Adjust motor phase sequence; 2. Adjust encoder A-, A+ or B-, B+.
RF234	**Encoder R pulse signal error** R pulse signal was not detected for a long time in the process of tuning.	1. No detection of R pulse signal; 2. Interference of encoder signal; 3. Error input of motor or encoder; 4. In the course of tuning, the motor is rotated in distress.	1. Check wiring for R pulse signal; 2. Elimination of encoder signal interference; 3. Verifying the number of motor poles and the number of encoder lines; 4. Open or close the brake in the process of self-learning.

Chart 8.5 Motor Initial Angle Static Tuning Fault List

Error Code	Definition	Possible Causes	Possible Solution
RF100	**Controller fault** The drive has fault and cannot do tuning.	Controller has met fault	First solve fault according to error code, then angle tuning again. Refer to **Chart 8.3 Driver Fault List.**
RF226	**Give voltage limit** Already give limit force during angle tuning, but feedback current cannot reach least requirement.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far less than the drive).	1. Check parameters of motor and encoder; 2. Decrease F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF227	**Output current over limit** During the tuning process, the driver controller detects that the output current has reached the limit and stops the output, indicating that the current is out of limit.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far more than the drive).	1. Check parameters of motor and encoder; 2. Increase F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF228	**ESC input** During the tuning process, ESC input is effective, and self-tuning is cancelled.	1. Release Up or Down button while tuning; 2. Fault occurs during angle tuning.	1. Angle tuning interruption, failure to complete, please do angle tuning again. Do not forced to run, there is a danger of losing control. 2. Check whether there is elevator logic fault, resulting in stop tuning. Refer to **Chart 8.1 Elevator System Faults List.**
RF229	**Over time at zero speed** Over time at zero speed Before start, feedback speed is not zero for a long time	1. Brake open or brake force is not enough; 2. There's interference in encoder.	1. Ensure brake is off; 2. Remove interference of encoder.

Chart 8.5 Motor Initial Angle Static Tuning Fault List (Cont'd)

Error Code	Definition	Possible Causes	Possible Solution
RF230	**Current detection error** During the tuning process, the feedback current value ultra-lower limit and the self-tuning condition is not satisfied.	1. Broken circuit at load side or lack of phase; 2. Imbalance phase of motor side or rated current wrongly set; 3. Inverter cannot adapt to motor. (Motor capacity is highly lower than inverter)	1. Ensure 3-phase connection to motor; 2. Ensure motor parameters setting; 3. Ensure motor should adapt to inverter.
RF231	**CD signals of encoder is abnormal** In the process of tuning, it is found that CD feedback position value is abnormal, and it is impossible to identify the CD line sequence.	1. Parameters of motor or encoder have been wrongly input; 2. Interference in encoder; 3. Error input of motor or encoder; 4. Wrong PG type set.	1. Check CD signals wiring; 2. Remove interference; 3. Verify parameters of motor and encoder; 4. Check PG type set.
RF237	**Motor moved while static angle calculation** When the motor angle position is inferred static, the motor cannot rotate to obtain the determined current position.	1. Brake open or brake force is not enough; 2. Bad encoder wire or interference in encoder.	1. Ensure brake is closed; 2. Check encoder A, B signals, remove interference
PF238	**Detection current is too small** In the Initial angle static tuning process, the output current value is lower than the lower limit, and the tuning condition is not satisfied.	1. The rated current of the motor may not be in conformity with the actual motor; 2. Motor/Controller connection is incorrect. (Break circuit or phase lost)	1. Check motor/controller connection; 2. Check rated current and rated power of motor.
PF239	**Encoder R pulse signal lost** No encoder R pulse signal detected after motor tuning for 10s	1. Interference in R pulse signal; 2. A & B signals connection error; 3. Inspection elevator speed setting is too low.	1. Check the encoder wiring; 2. Remove the encoder interference; 3. Ensure the normal operation of the motor; 4. Inspection elevator speed setting is too low.
RF252	**While static angle tuning, motor speed is over proof**	During static angle tuning, after initial location, motor need to rotate for 3 rounds. During rotating, system give out speed but receive no feedback and the lasting time of this status has been over limit. Then system announce error.	1. Check if there is feedback from SIN/COS encoder; 2. Check the phase of power input.

Note: 1. Above description is for SIN/COS encoder;

2. For increment encoder, RF231 correspond to UVW signals, RF234 and RF239 correspond to Z pulse. The solution is same, and other faults are same too.

8.5. Motor Parameters Tuning Faults

Motor parameters tuning error code and their possible causes and solution are shown below in Chart 8.6 and Chart 8.7. (Including rotation and static parameters tuning)

Chart 8.6 Motor Parameters Rotation Tuning Fault List

Error Code	Definition	Possible Causes	Possible Solution
PF2	Motor parameter input incorrect or no input.	1. Motor parameter input error; 2. Motor/Controller connection error.	1. Check motor parameters; 2. Check motor/controller connection.
PF3	Motor resistor tuning result error.	1. Input motor data is incorrect; 2. Wire not secured on terminal block.	1. Check input parameters; 2.Check the motor wiring and secured them on terminal block.
PF4	Motor leakage inductance tuning result error	1. Input motor data is incorrect; 2. Motor tuning with load.	1. Check the input parameters; 2. Make sure motor has no load.
PF5	Motor does not rotate in auto tuning.	1. Motor parameter input incorrect; 2. Wire loose on terminal block; 3. PG card damaged or wiring incorrect.	1. Check the input parameters; 2. Secure the wire on terminal block; 3. Check PG card and its wiring.
PF6	Motor cannot reach rated speed or rotate direction error.	1. Input motor data incorrect; 2. Motor input phase incorrect; 3. Encoder /PG card /wiring error.	1. Check the input parameters; 2. Check motor input phase; 3. Check encoder, PG card and wiring
PF7	No-Load Current error	Auto tuning motor with loads	Make sure the motor has no load.

Chart 8.7 Motor Parameter Static Tuning Fault List

Error Code	Definition	Possible Causes	Possible Solution
PF2	Initial fault	1. Motor parameters input incorrect; 2. Motor/Controller connection error.	1. Input correct motor parameters; 2. Check motor/controller connection.
PF3	Motor resistor tuning result error.	1. Input motor data is incorrect; 2. Wire not secured on terminal block.	1. Check input parameters; 2. Check the motor wiring and secured them on terminal block.
PF4	Motor leakage inductance tuning result error	1. Input motor data is incorrect; 2. Motor/Controller connection error.	1. Check input parameters; 2. Check motor/controller connection.
PF237	Motor is not held still at initial tuning period.	Motor brake is not close, or brake is too loose, causing sheave to move during initial tuning period	Make sure motor brake is tightly closed.
PF238	Current too small at initial tuning period.	Motor/Controller connection error.	Check motor/controller connection.

Chapter 9 Maintenance

This chapter describes precautions and notes for drive storage and maintenance.

9.1. Safety Precautions for Drive Maintenance & Storage

⚠ Danger

There are high voltage terminals in integrated controller, please DO NOT TOUCH.
Otherwise there has potential risk of electric shock.

Make sure to install front protection cover before power on integrated controller and cut power before removing the front protection cover.
Otherwise there has potential risk of electric shock.

Before open case service/maintenance, make sure the power is cut for 10 minutes, power on LED (CL) is off and DC+/- bus voltage is lower than 24V.
Otherwise there has potential risk of electric shock due to capacitor remain voltage.

Only authorized and qualified personnel are allowed to inspect/service integrated controller.
Otherwise there has potential risk of electric shock and damage the product.

Before maintenance, technicians must remove any metal objects (watch, ring, etc.), and must wear cloth with qualified isolation level.
Otherwise there has potential risk of electric shock.

DO NOT remove or change terminal ports at controller power on.
Otherwise there has potential risk of electric shock.

DO NOT change internal structure of the integrated controller.
Otherwise there has potential risk of electric shock and damage the product.

After maintenance, please make sure all terminals and contactors are tightly secured.
Otherwise there has potential risk of controller not functioning or even get damaged.

⚠ Attention

CMOS integrated circuits are applied in control board, please be aware.
If touch by hand directly, the control board may get damaged due to static charge.

9.2. Daily Check

In order to increase the life time of controller and make sure the safety operation of elevator, it is necessary to check and inspect controller in a daily basis. As it is not allowed to remove the controller front cover with controller power on, the controller can check by observing the device external condition, including:

1. Check if fan is working properly, including any abnormal noise.
2. Check if the LED indictor and digital operator of controller is working properly.
3. Check if there are any abnormal noise, vibration or smell.
4. Check thermal condition of controller and motor.
5. Check the ambient environment (Temperature -10~45℃, humidity 5～95%RH, no frozen, no oil mist or powder in air)
6. Check if the comfort level of elevator has decreased dramatically.
7. Check if the input power and frequency are within rated range.

9.3. Routine Inspection

In order to increase the life time of controller and make sure the safety operation of elevator, it is necessary to check and inspect controller in a routine basis. At routine check, first switch elevator to inspection mode, stop elevator operation and cut system power. Then please perform inspections procedures based on Chart 9.1, following safety precautions and notes mentioned above.

Chart 9.1 Routine Inspection Check List

Check Item	Definition	Possible Solution for fault
Terminal, connector, screws	Check for loose screws/bolts	Tighten the loose screws/bolts
	Check for loose connector	Reconnect the loose connector
Heat sink & Wind tunnel	Check for dust or any blockage.	Use dry air gun (0.4-0.6MPa) to clean dust, use proper tools to remove other attached objects.
PCBs	Check for dust, oil (conducting).	Use dry air gun (0.4-0.6MPa) to clean dust, use proper tools to remove other attached objects, replace PCB if necessary.
Cooling Fan	1. Abnormal noise & vibration 2. Color/shape change due to heat 3. Loose bolts, screws.	For 1,2: Change fan For 3: Tighten screws.
Power device	Check for dust	Use dry air gun (0.4-0.6MPa) to clean dust or other objects.
Capacitor	Check for color, smell	Change controller or capacitor if necessary.

9.4. Quick Wear parts

Controller is made from many components inside, all these parts have their lifetimes, and they depend on environment and working condition. As a result, in order to increase the life time of controller and make sure the safety operation of elevator, it is necessary to check and inspect some of these parts in a regular basis, replace them if needed. Chart 9.2 below is the components change standard.

Chart 9.2 Component change standard

Item	Life time	Change method
Cooling Fan	2-3 year (20000hrs)	Change new fan
Main circuit capacitor	5 year	Change new capacitor (Decide after inspection)
Main circuit fuse	10 year	Change new fuse
Capacitors on PCB	5 year	Change new PCB (Decide after inspection)
Other components	-----	Decide after inspection

Note: Conditions below are required in order for components to reach life time mentioned above.

Ambient temperature: Average 30℃ around one year

Load rate: Average below 80%

Running rate: Daily usage time <12 hrs.

9.5. Warranty

Integrated controller warranty period is 18 months after manufacturer (based on product name plate). However, even within the 18-month warranty period, repair cost will be charged in the following cases:

1. Damage caused by miss-operation – not following manual guidance
2. Damage due to use outside rated range
3. Damage due to abnormal application of the drive
4. Damage due to natural environment, such as fire, flood, earthquake etc.

Chapter 10 Controller installation with EMC Standard

This chapter explains in detail the integrated controller installation with EMC standard for reference.

10.1. EMC Briefing

EMC (short for Electromagnetic Compatibility) refers to the device/system capability to function normally in an environment with electromagnetic interference. It has two parts: first, the device/system must be able to work normally in environment with electromagnetic interference. Then, the electromagnetic interference it generated must be within a certain level so it will not affect other devices/systems in the environment.

10.2. EMC Characteristics of Integrated Controller

Same as other electronic devices, the integrated controller is affected by electromagnetic interference and at the same time it is also a source of electromagnetic interference. In order to enable the controller work normally in an electromagnetic environment, at the same time not to affect other devices, it is specially designed to deal with EMC characteristics shown below.

1. Input current is non-sine wave, with high frequency, this will cause strong electromagnetic interference.
2. Output voltage is high frequency PWM wave, this will cause strong electromagnetic interference.
3. As electromagnetic receiver, if controller receives too strong interference, it may not work properly.
4. Reduce controller generated electromagnetic interference will increase its own EMC level.

10.3. EMC Installation Guide

As determined by operating principle, the elevator integrated controller produces certain noises during operation. The effect of noise on peripheral equipment is relevant to the noise type, transmission path as well as the design, installation, wiring and grounding of drive system.

10.3.1 Noise Control

Basic strategy for noise control is to cut the transmission channel between noise source and noise receiver. Detail solutions are shown below:

1. Power cable and signal cable should be lay out separately and stay as far as possible, make sure to avoid two kind of cables stay in parallel or tied together. When meet situations in which signal cable must pass power cable, make sure two cables stay in perpendicular crossing and stay as far as possible.
2. All controller signal cable must have net shield, and the shield should be grounded at the controller side, with grounding area as large as possible.
3. For signal cables easy to get interference, such as encoder cable, it should have double twist shield cover, with grounding area as large as possible. One suggestion is to put the cable in metal tube or in an individual metal cable tunnel with reliable grounding condition.

4. Power cable and motor cable should use power cable with armor cover or shield. Power cable should use individual metal cable tunnel with reliable grounding point at controller side. Motor cable should follow the same grounding principle and its shield should also connect to motor cover at motor side.
5. Power cable should be connected to inverter use RFI filter or output reactor. Motor cable should be connected with output filter (sine/cosine filter) or install output reactor. Another solution is to surround motor cable twice with ferrite magnetic circle.
6. Other devices that are easy to get interference should be put far away from the controller and power cable.
7. Inductive devices around controller such as contactor, relay, brake unit, their coil need to install surge controller (such as RC filter, resistor or freewheeling diode).

10.3.2 Wiring

1. Wiring in Control Cabinet

1) Inside control cabinet, signal cable and power cable should be placed in different area, with minimum distance of 20cm. DO NOT put two kinds of cables in parallel or tied together. If must cross two cable, they must remain strictly perpendicular with each other.

2) The input (power) and output (motor) of power cable cannot cross or tied together, especial when the cable is connected with input/output filter.

3) Inductive devices inside control cabinet (such as contactor, relay, brake unit), their coil need to install surge controller (such as RC filter, resistor or freewheeling diode).

4) Both signal and power cable should have net shield/armor with high frequency low impedance.

5) Cable shield should ground with large area.

2. Wiring at site

1) Power cable must have 5 wires, including U/V/W, one for ground and one for neutral, DO NOT mix use.

2) At site, signal cable and power cable should be placed in different area, with minimum distance of 20cm. DO NOT put two kinds of cables in parallel or tied together. If must cross two cable, they must remain strictly perpendicular with each other.

3) Signal cables must have net shield, the shield should be grounded at controller side with large ground area.

4) Power cable and motor cable should use power cable with armor cover or shield. Power cable should use individual metal cable tunnel with reliable grounding point at controller side. Motor cable should follow the same grounding principle and its shield should also connect to motor cover at motor side.

10.3.3 Ground Connection

Controller must be connected to the ground at work, grounding helps to solve the EMC issue, at the same time it brings safety to the device and people. Ground correctly is the most important (and most reliable/economic) solution to EMC issue, and it should be considered first. Notes for ground connections are shown below:

1. Control cabinet must have GND public terminal (copper plate).

2. The case of control cabinet must be connected to the ground public terminal. This connection can be made between cabin door and ground public terminal copper plate (width >15mm).

3. All ground connection must remain complete on both sides, cannot connect two grounding wire in the middle.

4. The ground of integrated controller must be connected to the ground public terminal.

5. Power cable, motor cable and brake resistor cable (if necessary) shield/armor must be connected to the ground public terminal.

6. The distance from cable shield to ground public terminal should be <50mm.

7. Ground connection wire should have low impedance (large cross-sectional area and short in length).

8. Power cable should have 5 cores (U, V, W, neutral & ground) with shield, motor cable should have 4 cores (U, V, W, ground) with shield. For motor cable ground wire, one terminal should be grounded at controller side, another terminal should be grounded at motor side.

10.3.4 Leakage Current

Leakage current happens between wire and to ground, it depends on wire capacitance and controller carrier frequency. Leakage between wire is related to wire capacitance between controller input (power cable) and output (motor cable), controller carrier frequency, motor/power cable cross sectional area and length, while leakage current to ground is located at ground public terminal, it will get into the system and (in some case) affect other electrical devices through ground connection.

Countermeasure for leakage current:

1. Reduce controller carrier frequency;

2. Keep the power and motor cable as short as possible;

3. Power and motor cable cross sectional area should not be too big;

4. For long motor cable (>50m), controller output should have filter or reactor;

5. Should equip inverter use leakage current circuit break.

10.3.5 Power Line Filter

The power line filter is two-way low pass filter which only permits flowing of DC current or 50HZ operating frequency AC current but stops flowing of higher frequency electromagnetic interference current. Therefore, it cannot only inhibit the equipment's electromagnetic interferences flowing into power line but also inhibit the noises in power line flowing into equipment.

Precautions for Installation of Power Line Filter:

1. In the cabinet, the filter should be located close to the power line inlet as practicably as possible. Additionally, the filter supply line section left in the control cabinet must be as short as possible.

2. The power line filter should be grounded with reliable connection, and the grounding area should be as large as possible.

3. The power line filter metal case should be securely attached to the control cabinet plate, with contacting area as large as possible and ensure good electrical connection.

4. Please use power line filter that matches the system, such as inverter use power line RFI filter.

10.4. EMC standard satisfied by Integrated Controller

When install integrated controller and EMI filter, if the installation procedures are following EMC installation guide, then the system could meet the standards below:

EN61000-6-4：EMC test in Industrial Environment 1800-3。

EN61800-3：EMC Standard (2nd Level Environment)

EN61000-6-3：EMC Standard (Residential Environment)

EN61000-6-4：EMC Standard (Industrial Environment)

Appendix 1 Hoistway Switches Information (Partly)

F1.1 Leveling Switches & Flag Installation

For elevator leveling control, two leveling switches (up/down leveling switches) and some door zone flags (one in each floor) are required. Two leveling switches are installed on top of car, door zone flag is installed in hoistway, their dimensions and positions are illustrated in Figure F1.1. Leveling switches can be optical or magnetic.

Door zone flag adjustment:

1. Elevator stop at each floor, measure car and hall sills difference △S on each level at elevator park (car sills higher is position, lower is negative)
2. Adjust door zone flag on each floor, if △S>0, flag on this floor should move down △S; move flag up △S if △S<0.
3. Elevator need to redo the hoistway parameter learning after door zone flag adjustment.
4. Check elevator leveling on each floor, read part 1-3 if necessary.

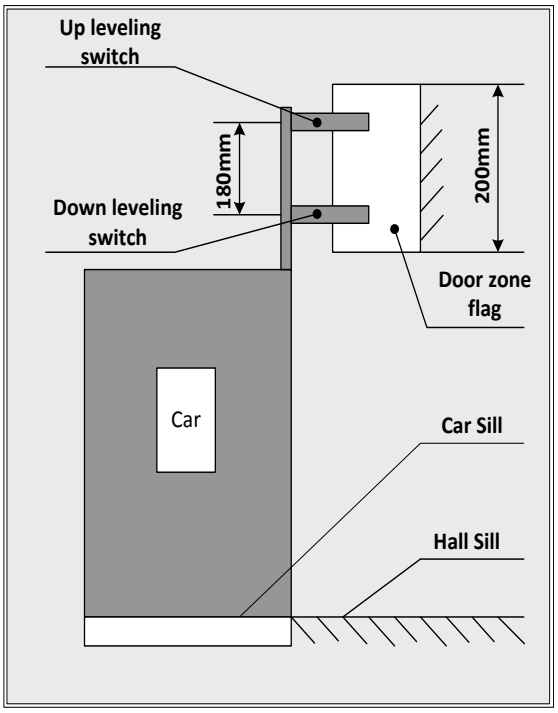


FIGURE F1.1 DOOR ZONE FLAG & LEVELING SWITCH POSITION

F1.2 Up/Down Terminal Switches Installation

1. Terminal switches are recommended to use non-contact type, such as magnetic switch.

2. Up/Down terminal switches are installed in hoistway guide rail; terminal flag is installed on top of car. Their positions are shown blow in Figure F1.2 & F1.3.

3. For elevator speed ≤1.75m/s, only one up and one down terminal switch and one terminal flag is required. For elevator speed ≥2.0m/s, more terminal switches should be installed for safety purpose. Please see below Chart F1.1 for up/down terminal switches position with different elevator speed.

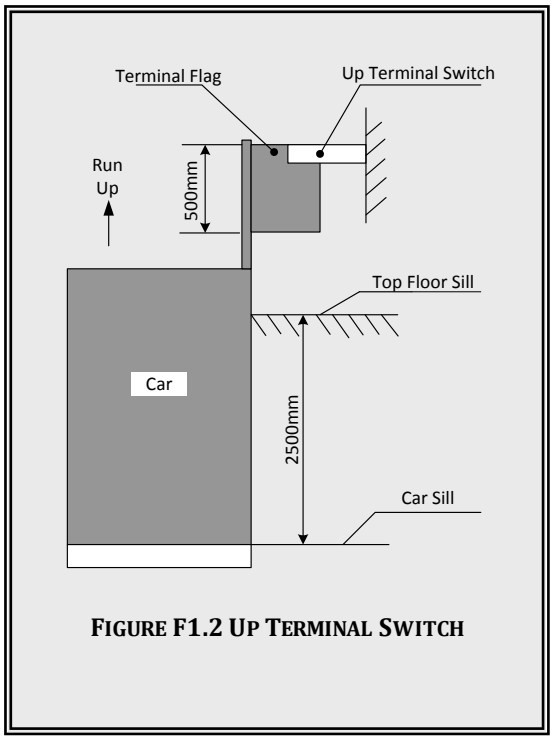


FIGURE F1.2 UP TERMINAL SWITCH

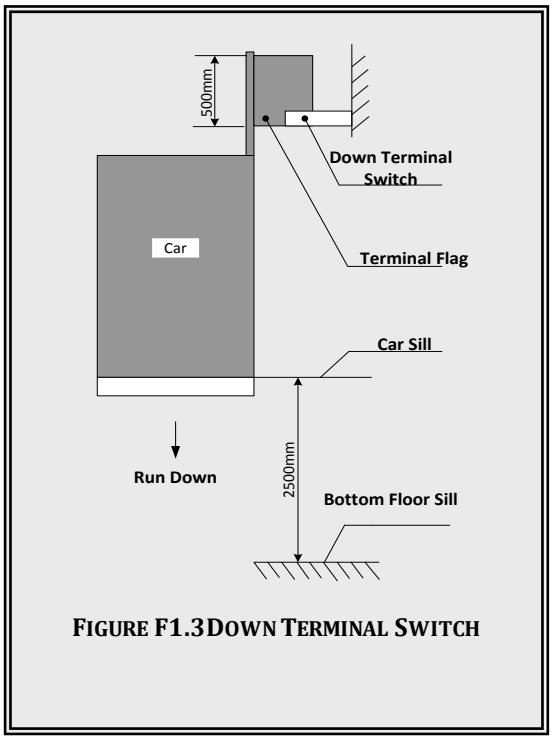


FIGURE F1.3 DOWN TERMINAL SWITCH

Chart F1.1 Up/Down Terminal Switches with different elevator speed

Terminal \ Speed	Terminal Switch Location		
	0.5m/s	1.0m/s	1.6m/s 1.75m/s
Up/Down Terminal Switch 1	1m	1.3m	2.5m

F1.3 Confirm the Terminal Switches Location

Up/down terminal switches signal is used for elevator force change speed and floor position calibration, they should be installed 2.5m from car top/bottom to top/bottom floor leveling position. (For elevator speed at 1.6m/s or 1.75m/s). To confirm such position:

1. Make sure elevator in inspection mode;
2. Set inspection speed to 0.3m/s , run up/down elevator;
3. Stop elevator when touching up/down terminal switches;
4. At this time the car sills and hall sills should have a distance of 2.5±0.1m.

Appendix 2 Parameters List

Chart F3.1 Controller Parameters &Factory Setting List

Parameter	Name	Default Value	Set Value
U0-00	Lower Limit	0	
U0-01	Upper Limit	0	
U0-02	Lower Slowdown 1	0	
U0-03	Lower Slowdown 2	0	
U0-04	Upper Slowdown 1	0	
U0-05	Upper Slowdown 2	0	
U0-06	Floor Data 1	0	
U0-07	Floor Data 2	0	
U0-08~68	Floor Data 3~63	0	
U0-69	Floor Data 64	0	
U1-00	Input Data	--	
U1-01	Input Bin	--	
U1-02	Input App	--	
U2-00	Output Data	--	
U3-00	Car Input Data	--	
U4-00	Run Times	0	
U4-01	Run Hours	0	
U4-04	CAN1SendAPP	--	
U4-05	CAN1ReceiveAPP	--	
U4-06	InterferApprais	--	
U4-07	Encoder Apprais	--	
U4-09	Loading Data		
U5-00	Ctrsoftware NO	--	
U5-01	DriveCodeVer	--	
U5-02	CpldEdition	--	
U6-00	Power	--	
U6-01	Ref Speed	--	
U6-02	Feedback Speed	--	
U6-03	Load	--	
U6-04	DC Voltage	--	
U6-05	Output current	--	
U6-06	temperature	--	
U6-07	Output torque	--	
F0-00	Total floor	6	
F0-01	Homing Floor	1	
F0-02	Fire floor	1	
F0-03	Parking floor	1	
F0-04	VIP floor	1	
F0-05	1st floor indicator setting	1	
F0-xx	Xxth floor indicator setting	1~63	

Chart F3.1 Controller Parameters &Factory Setting List (Cont'd)

Parameter	Name	Default Value	Set Value
F0-68	64th floor indicator setting	64	
F1-00	Car speed	1.60m/s	
F1-01	Motor speed	306r	
F1-03	Insp speed	0.15m/s	
F1-04	Start speed	0.01/s	
F1-05	Leveling Speed	0.15m/s	
F1-06	Least Speed	0.5m/s	
F1-07	Open Door Speed	0.15m/s	
F1-08	Relevelst Speed	0.25m/s	
F1-09	Relvelrun speed	0.05m/s	
F1-10	Acceleration B1	$0.2m/s^2$	
F1-11	Deceleration B2	$0.2m/s^2$	
F1-12	S Curve P1	$0.2m/s^3$	
F1-13	S Curve P2	$0.2m/s^3$	
F1-14	S Curve P3	$0.2m/s^3$	
F1-15	S Curve P4	$0.2m/s^3$	
F1-16	Zero Speed	1RPM	
F1-17	Leveling Adj	50mm	
F1-18	Load Adj	0	
F1-21	Drive mode	0	
F1-22	Two Door Mode	0	
F1-23	Fire Mode	1	
F1-24	Parallel No.	0	
F1-25	Twins Control	0	
F1-26	Group Control	0	
F1-27	Far monitor	1	
F1-28	Auto Parking	0	
F1-29	Load Enable	0	
F1-30	Open Delay Time	0	
F1-31	Brake Feedback	1	
F1-32	Solution Ladder Password	0	
F2-00	Brake ON Time	1s	
F2-01	Brake OFF Time	1s	
F2-02	Insp Brake Time	0.9s	
F2-04	Zero Time	0.21ms	
F2-05	Open Door time	5s	
F2-06	Open Delay Time	60s	
F2-07	Homing Time	60s	
F2-08	Door Run Time	8s	
F2-09	Beep Delay Time	0.15s	
F2-10	Enable Delay	0.5s	
F2-11	Lamp Off Time	15min	

Chart F3.1 Controller Parameters &Factory Setting List (Cont'd)

Parameter	Name	Default Value	Set Value
F2-12	Over Time	45s	
F2-13	SmoothStart Time	0.50	
F2-14	Start Time/Hour	00	
F2-15	Start Time/Minute	00	
F2-16	Stop Time/Hour	00	
F2-17	Stop Time/Minute	00	
F2-18	Start Time 1/Hour	00	
F2-19	Start Time 1/Minute	00	
F2-20	Stop Time 1/Hour	00	
F2-21	Stop Time 1/Minute	00	
F3-00	Input type	4024434279	
F3-01	Car input type	2147090191	
F3-02	Input select 1	13	
F3-03	Input select 2	14	
F3-04	Input select 3	23	
F3-05	Input select 4	24	
F3-06	Input select 5	25	
F3-07	Output select 1	0	
F3-08	Output select 2	11	
F3-09	Output select 3	12	
F4-00	Set Stop Floor1	4294967295	
F4-01	Set Stop Floor2	4294967295	
F4-02	TIM Stop Floor1	4294967295	
F4-03	TIM Stop Floor2	4294967295	
F4-04	Door Select A1	4294967295（1~32 level）	
F4-05	Door Select B1	0（1~32 level）	
F4-06	Function Select	538458116	
F4-07	Function Select 2	0	
F5-00	Motor type	0	
F5-01	Poles	20	
F5-02	Rated Freq	16	
F5-03	Motor rated power	2.2	
F5-04	rated speed	96	
F5-05	V IN	280	
F5-06	L_phase	--	
F5-07	R_phase	--	
F5-08	Rated FLA	--	
F5-09	Non-load current	0	
F5-10	slip frequency	1.5HZ	
F6-00	Carrier Freq	8HZ	
F6-02	SpeedZoom	100%	
F6-03	DirSel	0	

Chart F3.1 Controller Parameters & Factory Setting List (Cont'd)

Parameter	Name	Default Value	Set Value
F6-04	Kp	600	
F6-05	KI	300	
F7-00	PIMulEnable	0	
F7-01	PI1 Range	0	
F7-02	PI2 Range	0	
F7-04	PI3 Range	0	
F7-05	Kp1	1200	
F7-06	Kx1	900	
F7-07	Kp2	0	
F7-08	Kx2	0	
F7-11	Kp3	600	
F7-12	Kx3	500	
F8-00	Encoder PPR	2048	
F8-02	PG Type	1	
F9-00	Max Torq Comp	0%	
F9-01	SPDSourceSel	2	
F9-03	Spderr Set	5	
F9-11	Load Comp Enable	0	
F9-13	Load Source Sel	0	
F9-19	UP Comp Bias	0	
F9-20	DOWN Comp Bias	0	
F9-21	FULL Comp Pro	100%	
FA-00	StratKP	30	
FA-01	StratKI	1200	
FA-04	ZeroKeepKP	180	
FA-05	ZeroKeepKI	550	
FA-08	PLKP	1200	
FA-09	PLTime	900ms	
FA-11	IntegralGain	300	
FA-12	FluxGain	125	
FC-00	Zpulse_Init	0	
FC-07	KpIreg	30000	
FC-08	KxIreg	15000	
FC-13	AutoTuneModeSel	1	
FC-14	N Temp Alarm Ena	1	
FC-15	InitTuneEnable	0	
FC-16	CD DirSel	0	
FC-17	Encode Level	60	
FC-18	Torque Limit	185	
A0-00	Language Sel	English	
A0-01	User Password	000000	
A0-02	Factory password	000000	

A0-04	Contrast	5	

Appendix 3 NS05 Series Villa Lift Control Cabinet Intensive Serial Communication Resolution

1. Top limit and bottom limit

Setting F4-07-02 as ON, top limit and bottom limit signals are not necessary to be wired in hoistway cable, and 2 cables will be saved.

Top terminal and down door zone signals are active at the same time, and up door zone is not active, system will generate a top limit signal automatically; Bottom terminal and up door zone signals are active at the same time, and down door zone is not active ,system will generate a bottom limit signal automatically.

2. Serial Open and close output

CAN bus controlling COP door open or close can be achieved. In this way, 5 cables of two door open /close signals and their common terminal will be saved. Door open 1, door open 2, and door close will use the terminal on car top board.

3. Serial electric lock and fire

Electric lock command and fire command are added into the CAN communication between integrated controller and HOP. With BL2000-HAH-M1.1, FR2000-HAH-V9, BL2000-HAH-B9 dot matrix display HOP, serial bus controlling lock and fire mode can be achieved. In this way, 2 cables of electric lock and fire signal and their common terminal in hoistway cables can be saved.

Serial fire and electric lock functions setup method: Short circuit the "DS" jumper.

For one elevator, only one HOP board can short the "DS" jumper. If lock floor and fire floor are not at the same floor, please wire to other floor HOP board from this board.

BY0-3	24V Common Terminal	BY0-4	Spare input 0
BY1-3	24V Common Terminal	BY1-4	Spare input 1

Default: Spare input 0 is electric lock input; Spare input 1 is fire input.

Integrated controller main board parameters should be set as follow:

F4-07-03 setting as ON, serial electric lock function is enabled.

F4-07-05 setting as ON, serial fire function is enabled.

F4-07-06 setting as ON, serial fire type is reversed

Serial fire signal has been enabled, main board fire signal (X12) is still available, both of the two signals can bring the elevator into fire mode.

If main board enables the serial electric lock and serial fire function, but it has no wire to HOP or jumper "DS" on HOP board is not shorted or communication is interrupted, the elevator cannot enter into electric mode or fire mode.

Appendix 4 Menu Operation Processes With 4 Digital Tubes & 3 Operation Keys

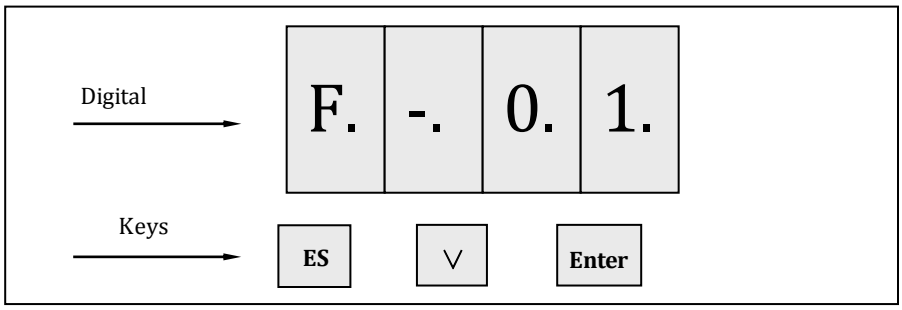


Figure F4.1 Display and key layout

There are 4 sets of segment displays on the main board, each set has a dot (from version 7125 starts, these dots are used to indicate elevator state information).

Under normal state without error (Inspection, Manual, Used, Fire, Stop):

First dot represents front door light curtain and safety edge signals. Signals are valid, dot lights on. Dot turns off when signals are invalid;

Second dot represents rear door light curtain and safety edge signals. Signals are valid, dot lights on. Dot turns off when signals are invalid;

Third dot represents inspection signals via CAN communication (car top and pit). Communication inspection signal is valid, dot lights on. Dot turns off when signals are invalid.

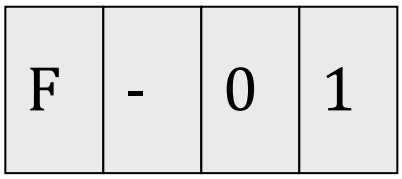
Fourth dot is reserved.

ESC: Cancel/return key;

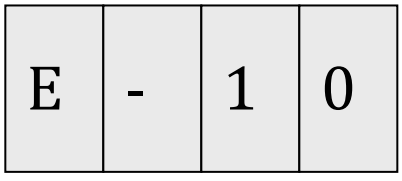
▽: Flip key;

ENTER: OK key;

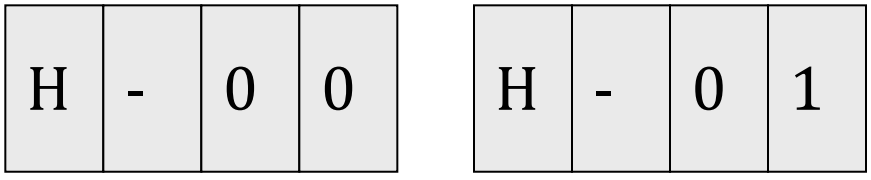
1. **Normally, display current floor F-XX:**



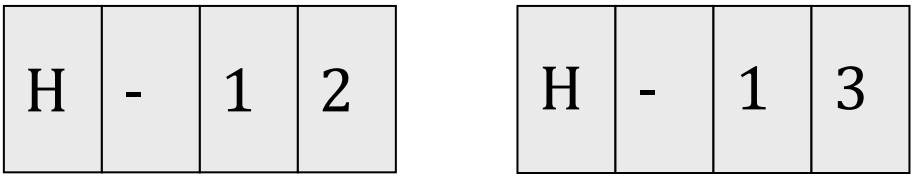
2. **Digital tube flashing display error code when fault occurs.**



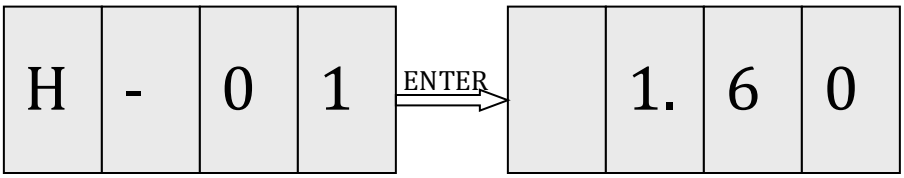
3. **Press ENTER key and Flip key to select H-00~H-07 parameters:**



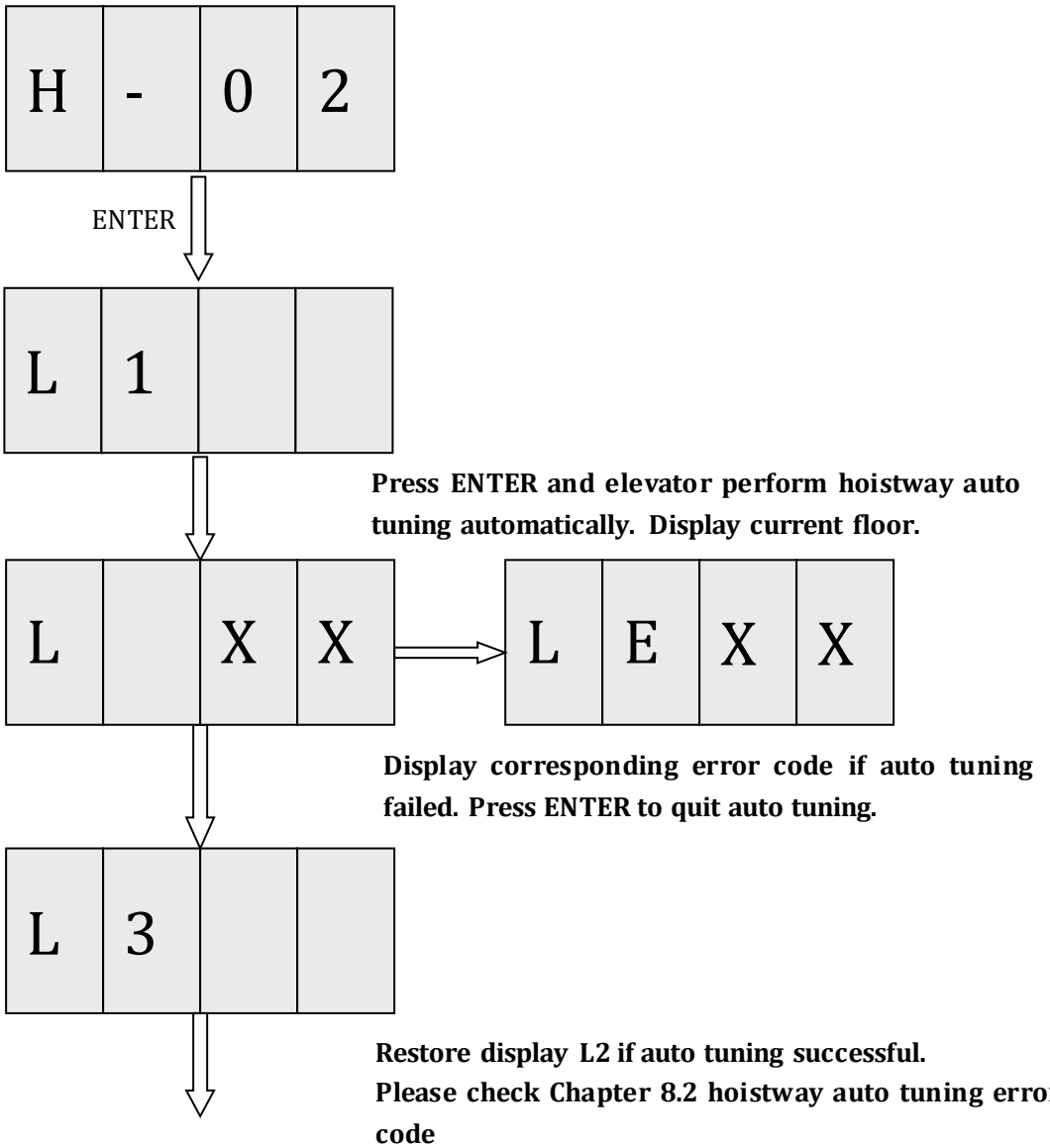
... ...



4. H-00: Invalid parameter;
5. H-01: Display current running speed (Unit: cm/s):



6. H-02: Hoistway parameter self-learning:

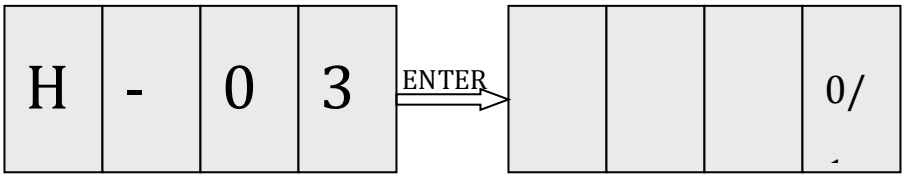


7. H-03: Temporary shielding overload signal, which is used for fast shielding of overload signal when running with 125% loads. This parameter is not saved. Power off, fault or exit from the menu will automatically reply overload signal.

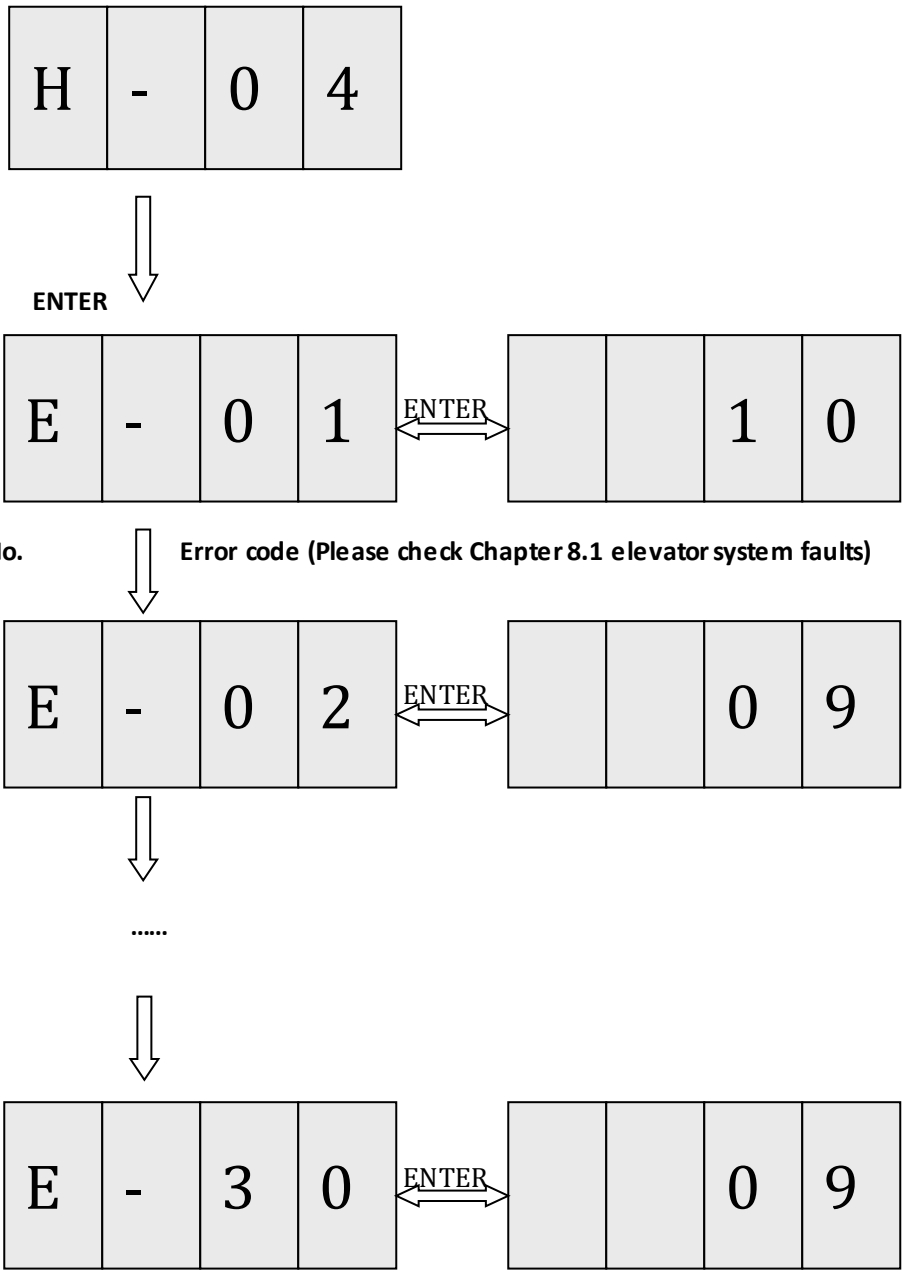
   H-03=1 Shielding overload signal (including switch weight and analog weighing)

   H-03=0 Unshielded overload signal.

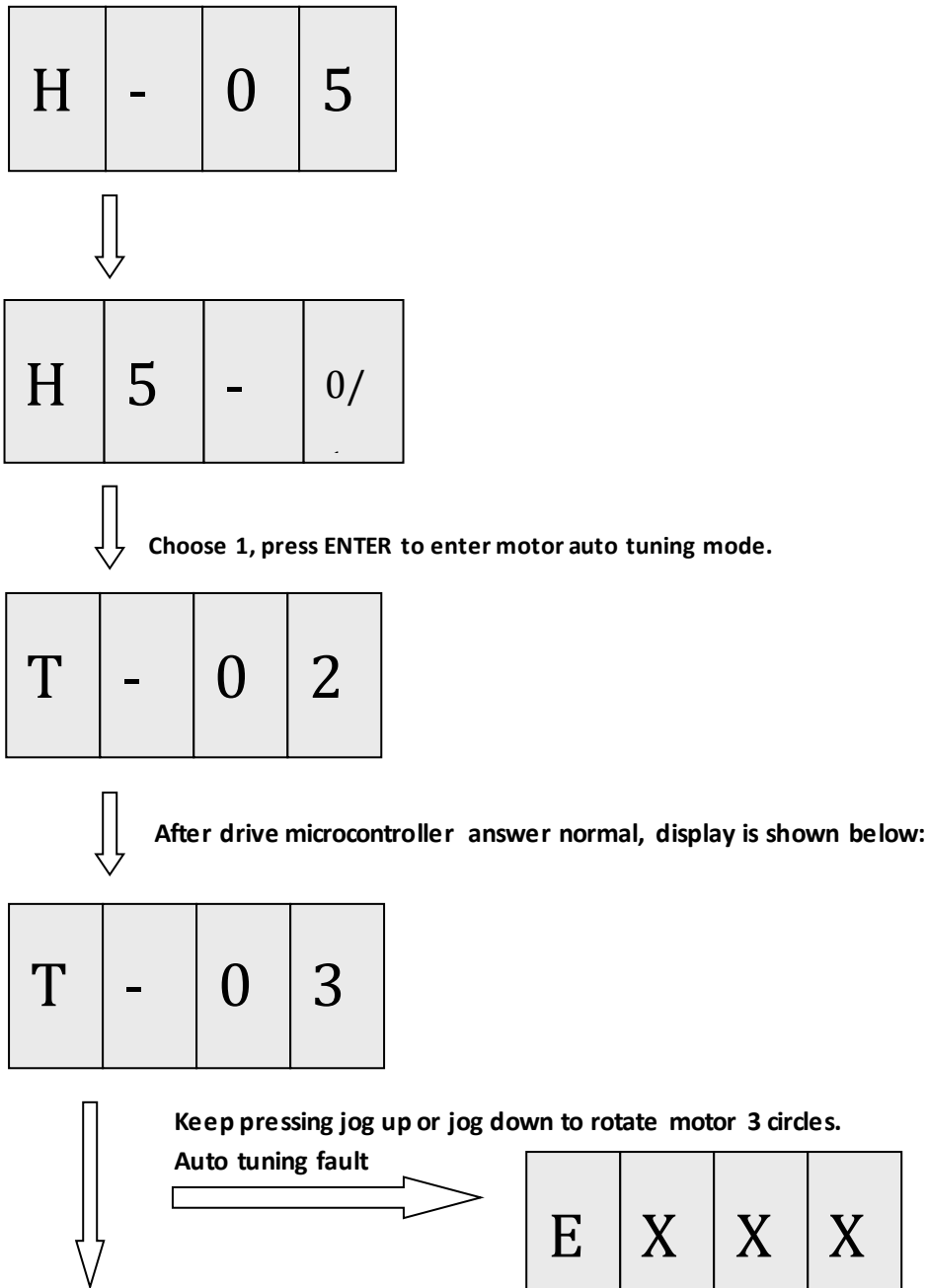
(This function is included by 1**0_7013 or 1**0_7113 and later version, refer to U5-00 for software number.)



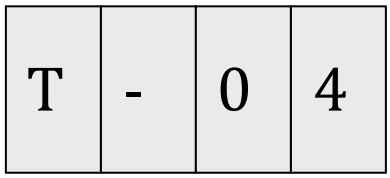
8. H-04: View 30 fault recodes.



9. **H-05: Motor static angle auto tuning**



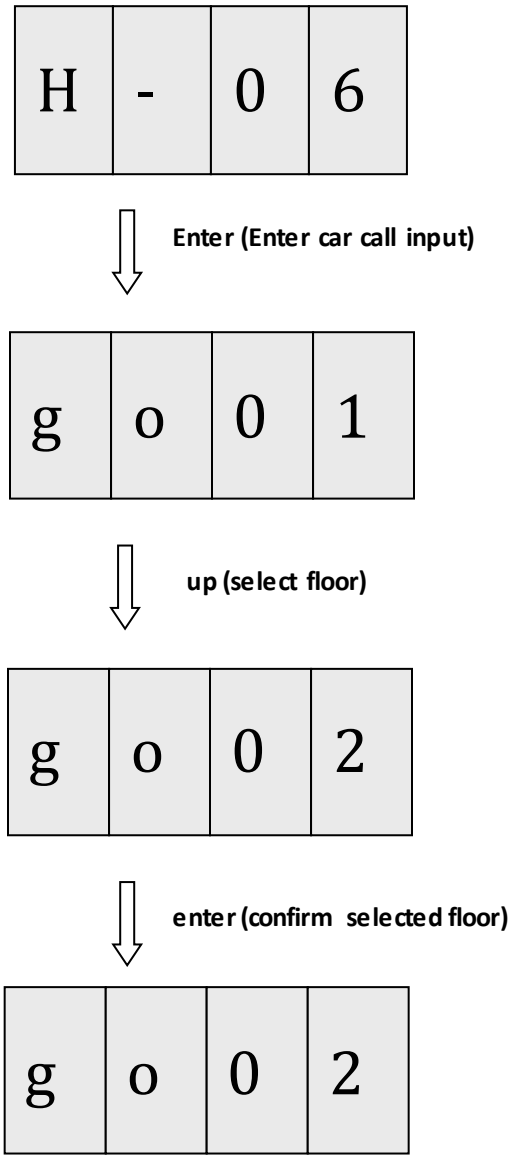
Handling according to error information prompted.



Auto tuning proceeds gradually.

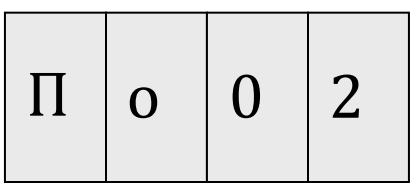
Press ENTER to quit.

10. H-06：Car call input

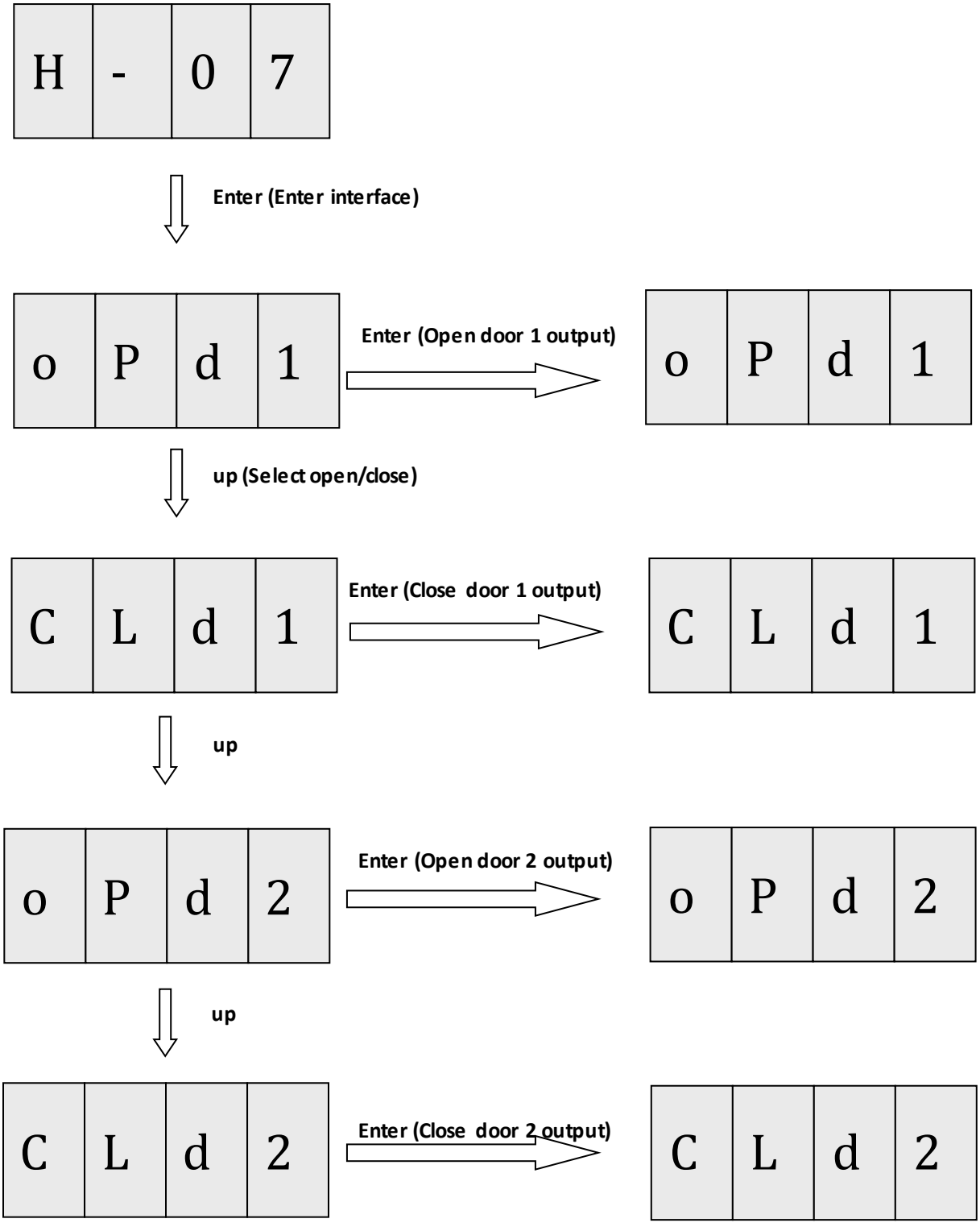


Press Ecs to exit.

Note: if there is an abnormal condition (such as non-stop floor), the system will not be selected internally. At this time, the digital block will display as follows:



11. H-07：Open/Close door control



12. H-08：Temporary expansion of the electric torque and brake torque amplitude limit, while the output current will be amplified to the limit. It is specially used to test the slipping of wire rope. This parameter must be modified in the condition of inspection, and it is not allowed to save and power off, fault, withdrawal of the menu, or the recovery of automatic running will all automatically recover the related parameters. In this

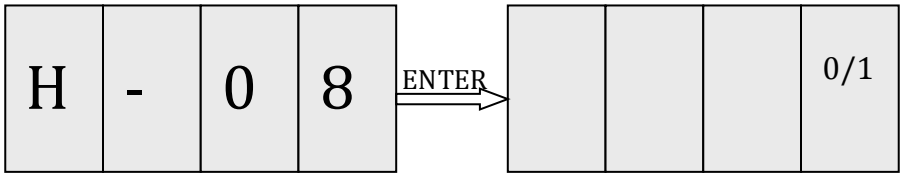
mode, each running up in inspection mode, the parameter is automatically return to zero, if you want to run again, please reset the parameter to 1, and then retest by slow up/down key.

The limiting current is related to the rated current of the motor and the maximum output capacity of the power module of the integrated controller. If the maximum output current of the module is greater than 2 times of the motor rated current, the maximum output current of the module will be limited to 2 times of the motor rated current in order to avoid the damage of the motor. Otherwise, the output current will be output by the maximum output current of the module, so as to ensure that the whole power module is in the maximum output state when the wire rope slips.

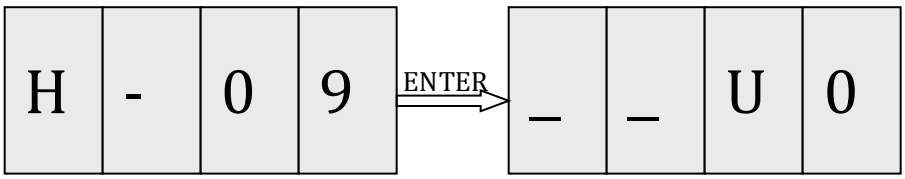
H-08=1 Enter the testing mode of the wire rope slipping.

H-08=0 Exit the testing mode of the wire rope slipping.

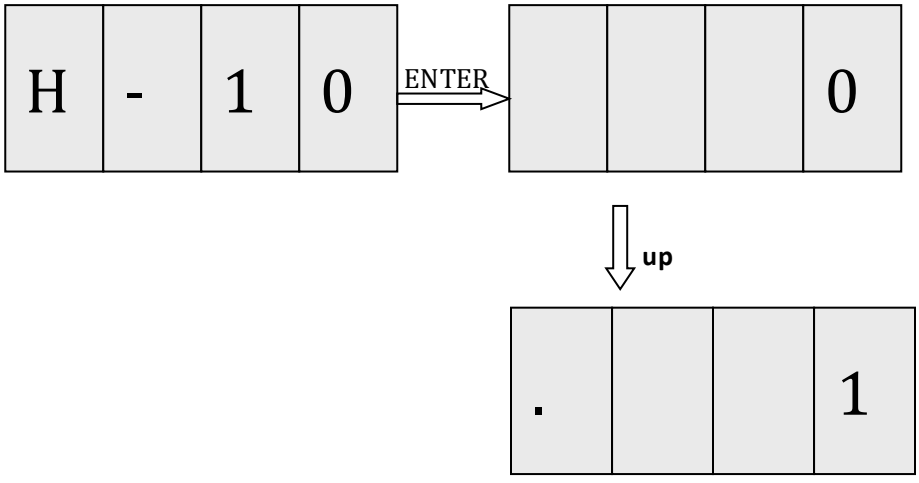
（The controller version of the function is 1**0_7013 and 1**0_7113 and above. Please check U5-00 for version number.）



13. H-09： Add a H menu to display the V0 version of the self-monitoring subsystem. H-09=__U0: click the confirmation at the H-09 interface to show the _U0.



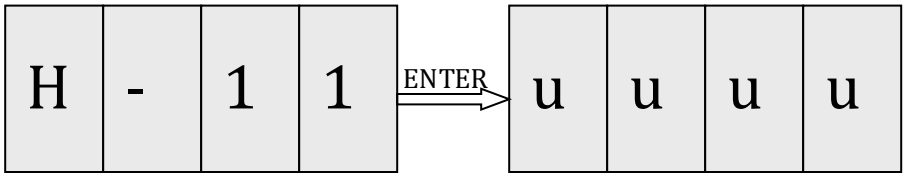
14. H-10： The digital block small menu H-10=1 can temporarily shield the limit fault, run to the up/bottom limit in inspection mode, switch: H-10 interface click confirmation into the setting interface, default is 0, click UP key, change to 1, at this time run to the up/bottom limit in inspection mode. After the operation is finished, the value recovery to 0.



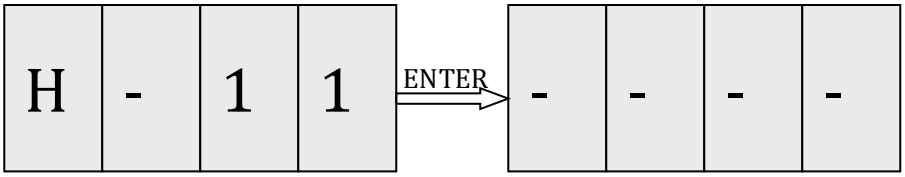
Press Esc to exit.

15. H-11： Balance position indicator of inorganic room system.

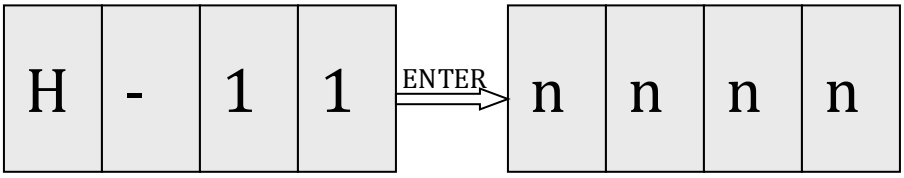
"U" indicates that the car position is above the balance point：



"-" means that the car is in a balanced position.

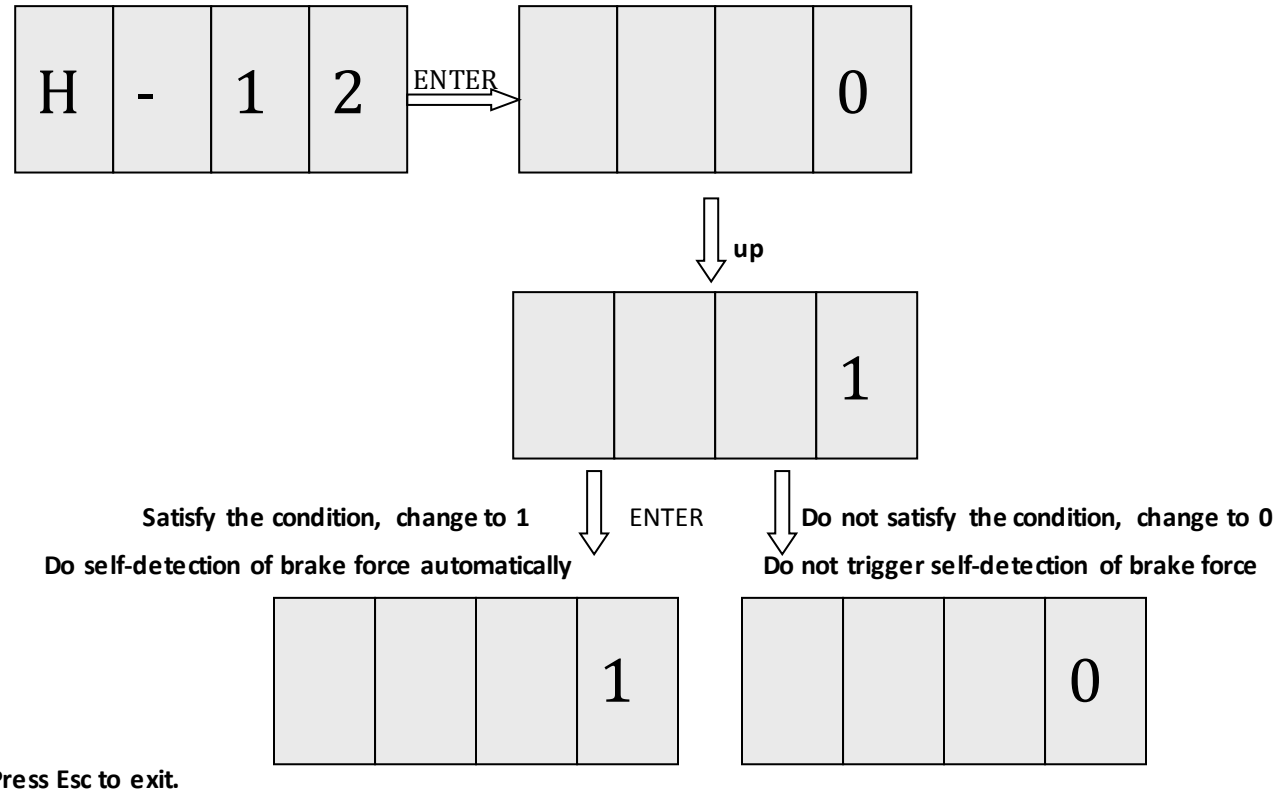


"N" indicates that the car position is below the balance point：



Press Esc to exit.

16. H-12：Self detection function of brake force.



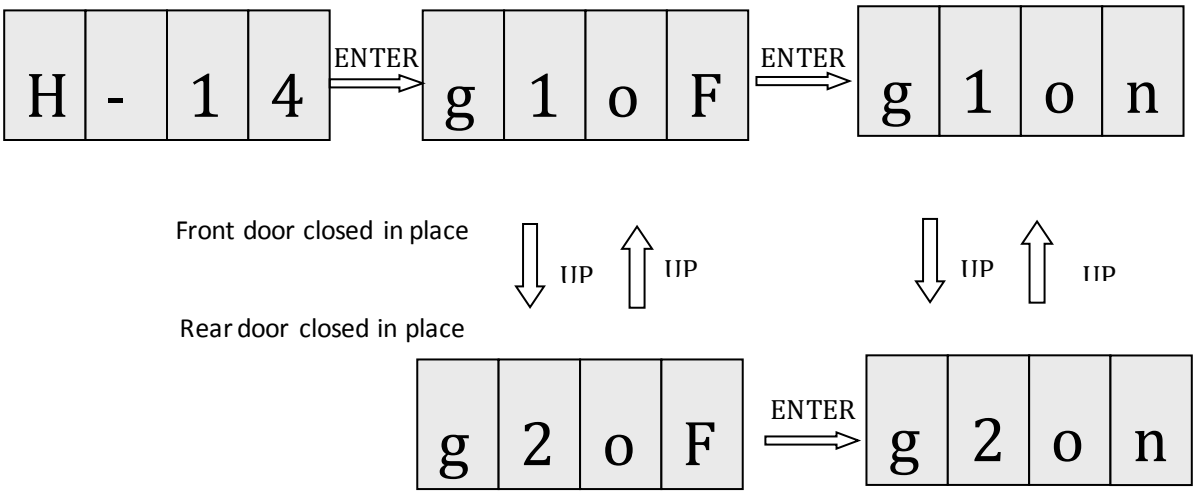
Press Esc to exit.

17. H-13：Spare

18. H-14：Set the door closing limit type

The input types of closing limit 1 and closing limit 2 can be set through the keypad H-14 menu on the main board. During the installation and commissioning of a new elevator, neither the car nor the car roof is installed. When the control cabinet directly seals the safety circuit and the door lock circuit bypass, the elevator cannot run because there is no door closing limit signal reporting Er56 fault or the door lock is always open. At this time, the input type of the door closing limit can be reversed through the H-14 menu to make the door closing limit effective and the elevator can run normally. Please reset the door closing limit according to the actual closing limit after debugging.

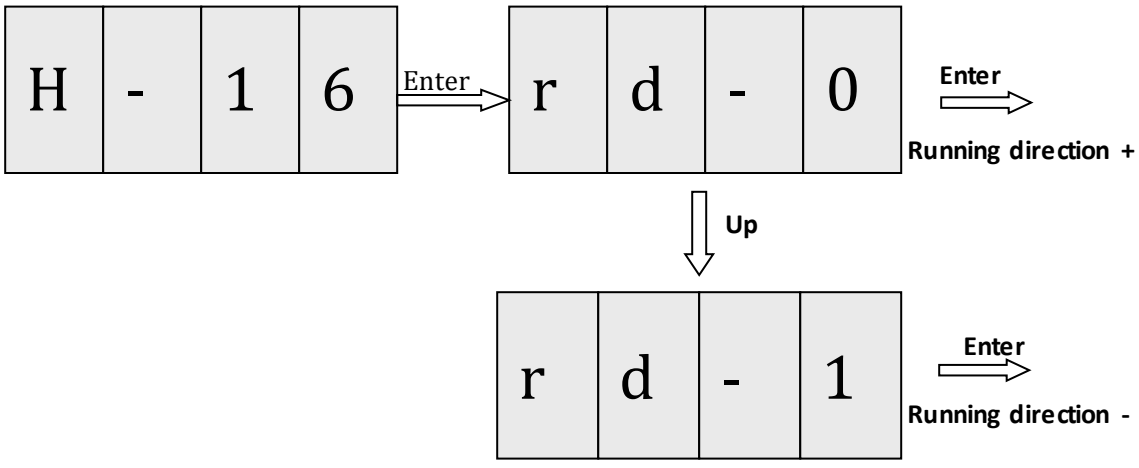
H-14 setting value is the same as the manual operator setting parameters F3-01-04 and F3-01-06.



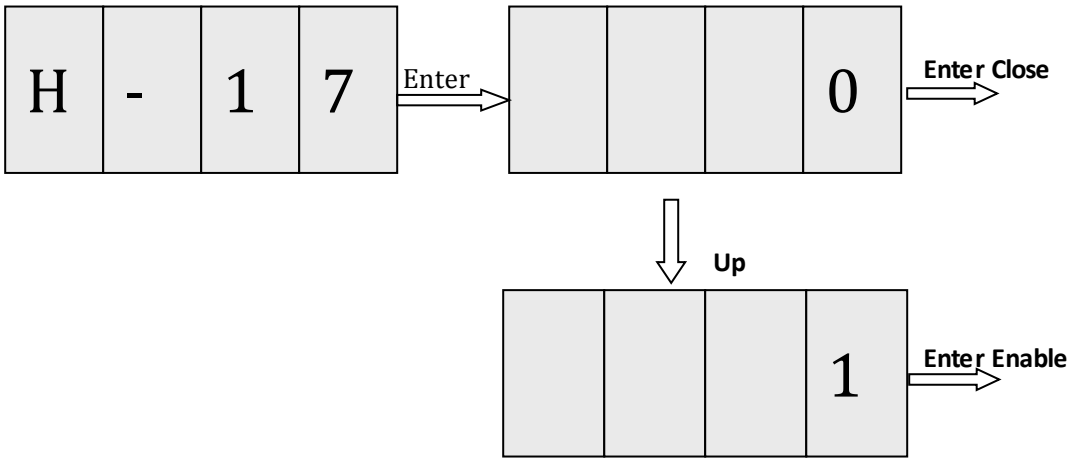
Exit the setting menu, and the parameters will be saved automatically.

19. H-15：Spare

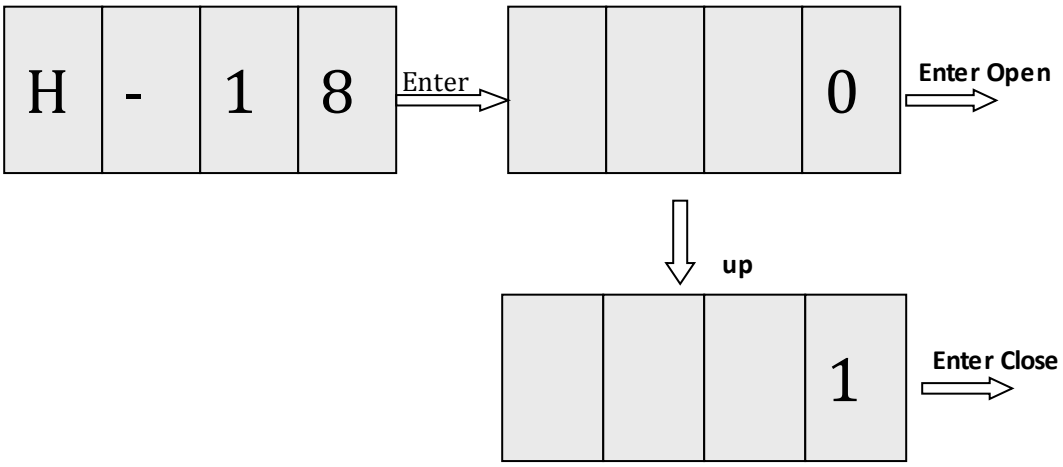
20. H-16：Operation direction selection



21. H-17： Holding brake feedback switch enable



22. H-18： Single door area enabling



Appendix 5 ARD And Electric Brake Release Emergency Rescue Function

NS05 series villa lift cabinet has considered the cooperation with elevator emergency leveling device and built-in ARD unit, to supply reliable emergency rescue solution. When power drop, controller will start ARD. When ARD complete or cannot run, customer can use manual operation to start electric brake release..

F5.1 ARD Emergency rescue

1. When AC220V power drop, system detect power grid lost, 10 sec later, it will start ARD emergency power.
2. Only close the power switch in cabinet, if AC220 input still exist, ARD will not start.
3. After ARD power start, system will automatically stop at nearest floor and keep door open. After passenger leave, 30 sec later, door automatically close and stop running.
4. If elevator stop for 10 minutes, ARD will automatically shut down.

Note：

1. When maintain cabinet, after power off, do not operate cabinet immediately. Wait for 1 minute, ensure ARD doesn't start then operate. Beware of ARD automatic start, that may cause electric shock.

2. When manually power off, please firstly cut off Q1 power switch, wait for 1 minute, then cut off AC220Vpower, then ARD will not start.

3. If ARD already start, to turn off ARD, need to wait for 10 minutes, then ARD will automatically shut off or recover AC220V power, then ARD power will be turned off.

4. If the ARD power supply has been started and you want to switch to the electric opening state, operate the emergency electric operation switch to the emergency electric operation state, and the elevator is still and does not run, press and hold the "" start "" button for 3s and then release it, the ARD will be closed, and it will start to enter the electric opening state after 10s.

5. When the ARD battery power is lower than 60% or the ard and battery fail, the main board nixie tube will alternately display the floor information and battery power (this display is only a reminder, and does not affect the elevator operation):

1) The battery is low, for example, when 50%, the nixie tube alternately displays b-50 (power)<->F-01 (floor display);

2) In case of ARD or battery failure, the nixie tube will alternately display b-EE (battery failure)<->F-01 (floor display).

F5.2 Electric brake release rescue

1. When the AC220 power supply does not exist, the ARD emergency power switch is enabled, and the system is in no power state (the ARD power supply is not put into operation), the electric brake release rescue function can be started;
2. First, switch the "main switch" of the control cabinet to OFF, and after the system is completely powered off, long press the "electric opening start" button for 2 seconds to start the equipment;
3. Operate the emergency electric operation switch to make the system in the emergency electric operation state, and ensure that the car door and hall door are closed (the door lock can also be saved when it is disconnected, but there is a risk of shearing);
4. If the elevator is not at the leveling position, press the "public" and "forced" buttons for electric brake opening at the same time, the system will output the power supply for brake opening. Release the button, and the power output will be immediately canceled. When the elevator runs to the leveling position, the power output will be automatically canceled;
5. If the elevator is at the leveling position, press the "public" and "forced" buttons of electric brake opening at the same time, the system will output the power supply for brake opening again. Release the button, and the power output will be immediately canceled. When the elevator runs away from the leveling position, the power output will be automatically canceled;
6. Press the "Public" button five times in a row within five seconds to reverse the contact type of the door area leveling signal;
7. There is no operation within 1 minute, and the system will power off automatically. Please restart.

Note：

1. If long time stored, please charge it at least each 6 months for one time (no less than 8 hours).

2. First time installation, please continuously charge it for 8 hours.

Appendix 6 Control plan for villa special door structure

F6.1 Hand pull door+ retiring cam

1.1 Hardware configuration

1.1.1 Cabinet:NS05 villa cabinet.

1.1.2 Retiring cam:Installed on car top, only when elevator is at unlocking zone, retiring cam will eject and push hall door lock, then hall door can be open. When retiring cam is taken back or not at unlocking zone, hall door will be locked and cannot be opened.

1.1.3 Car: No car door, can install light curtain. When light curtain is valid, elevator cannot run. If light curtain is valid during running, elevator will decelerate and stop running. Only when light curtain signal becomes invalid, it can recover to run. If there's no light curtain, it need to set parameter to cancel light curtain.

1.1.4 Hall door:Hall door is hand pull door with lock device. Only when retiring cam on car top eject and jacking locking device to open, hall door can be open. Hall door must have a set of close contacts, and another set of locking contacts are suggested：

Close contact: When Hall closes well, hall door close contact will be connected. If hall door opens, the hall door close contact will be cut off；

Locking contact: When hall door is locked, hall door locking contact will be connected. If hall door lock open, hall door locking contact will be cut off.

1.2 Parameter setting

1.2.1 F4-06-12 sets to ON.

1.2.2 F4-06-13 sets to ON.

1.2.3 F4-06-31 sets to ON to enable hand pull door function.

1.2.4 Set F4-06-19=OFF， F4-06-20=OFF.

1.2.5 If no light curtain, set F3-01-17=ON and F3-01-18=ON.

1.2.6 Set F3-09=6.

1.2.7 Set F4-07-02 to ON.

1.3 Wiring configuration

1.3.1 Serially connect close contact of hall door at each floor and finally connect to X31. Serially connect locking contact of hall door at each floor and finally connect to X30. If no locking contact, please connect it to close contact feedback together.

1.3.2 X31 feedback point is hall door close contact input, X30 feedback point is hall door locking contact input.

1.3.3 Mainboard output Y6 is locking control output for retiring cam. When Y6 output, the electromagnet of retiring cam will act and retiring cam will take back, hall door will be locked. When Y6 has no output, retiring cam will eject and hall door lock will be opened.

Y6 controls retiring cam directly. The Com of Y6 needs to be selected between AC220 and DC 24 according to the power of retiring cam. Y6 output terminal:GC3-15, Y6 ; GC3-7, COM.

The retiring cam control can also use front door close output on car top board. Please notice, the output of car top board is OC door output. So when using car top board output to control retiring cam, it cannot control the solenoid coil directly, it needs to add a middle relay to convert control. Car top close output terminal on iBL6-DIO interface board PC1-2:CM1 and PC1-4:GM1.

1.3.4 Because the retiring cam needs to be controlled, one more cable needs to be added in traveling cable. If using car top control, there's no need to add traveling cable but one relay needs to be added on car top.

1.3.5 Because there's hall door locking detection, one more cable needs to be added in shaft cable. If there's no hall door locking contact, this cable is not needed.

1.4 Time sequence

1.4.1 Hall door is pulled to open, X31 is invalid. After hall door closed, X31 is valid. If system confirms direction(car call or hall call or inspection running) and light curtain isn't blocked, integrated mainboard Y6 relay will output (or car top close output), the electromagnet gets power and take back retiring cam. After hall door close and retiring cam is taken back, X30 door locking contact will close. System has start condition and be able to run after brake open.

1.4.2 After retiring cam control output, no matter in inspection or auto mode, if hall door lock cannot close after 10 seconds (X30 door locking contact keep invalid), it will show Er31 fault.

1.4.3 After Er31, if hall door locking is still not connected in 5 seconds, system will reset to fault automatically and permit lock again; But if after 3 times of closing operation, door locking circuit always cannot be connected (X30 invalid), the fault will be kept and it will not retry, car call and hall call will be cleared. At this moment, it needs to open hall door (X31 invalid) or power off, or totally close door locking circuit to reset the fault.

1.4.4 After hall door circuit X31 is connected, if elevator keep static without running for F2-11 setting time (min), car light will be turned off. When the hall door is open, car light will be recovered.

1.4.5 When elevator is not running and someone blocks the light curtain, retiring cam will not output and elevator will not run. When elevator is running and someone block light curtain, elevator will decelerate immediately and stop, not sudden stop but will show Er54 fault. After light curtain recover, elevator will rescue to leveling postion.

1.4.6 After hand pull door elevator stop at leveling position, if door isn't opened, it must wait for F2-05 (Open door time) and then can continue to run. The minimum time is 10s. If parameter is set less than 10, it will be treated as 10 sec.

1.5 Other description

If the control of retiring can need unlocking output control, set F3-09=23 then it will output reversed logic. After elevator stop, it will output unlocking signal, then manually open hall door. After hall door closed, it will cancel unlocking signal and lock hall door.

1.6 Door circuit diagram

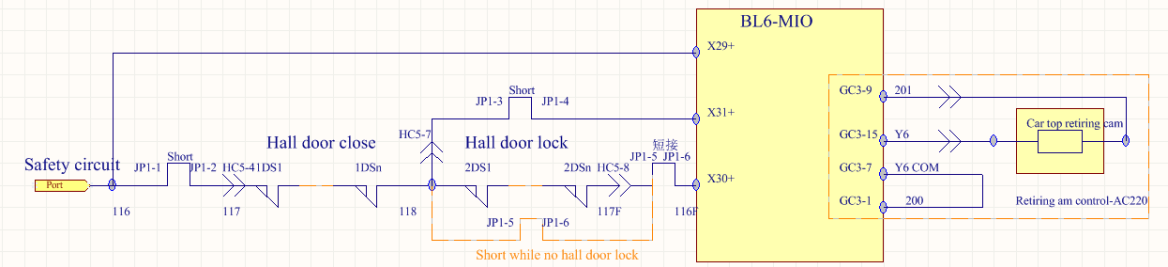


Figure F6.1 Hall pull door+ retiring cam method

F6.2 Hall pull door+ hall door electric bolt lock

2.1. Hardware configuration

2.1.1 cabinet： NS05 villa lift cabinet.

2.1.2 Electric bolt lock： Electric bolt lock is installed at hall door of each floor. Only when electric bolt lock is open, hall door can be opened. After electric bolt lock is locked, if hall door close, it cannot open. If hall door is not closed, it can be closed and will be locked after closed.

2.1.3 Car： No car door, can install light curtain. When light curtain is valid, elevator cannot run. If light curtain is valid during running, elevator will decelerate and stop running. Only when light curtain is invalid, elevator recover to run. If there's no light curtain, it needs to set parameter to cancel light curtain.

2.1.4 Hall door： Hall door is hand pull door with lock device. Hall door must have a set of close contacts, and the electric bolt lock can have a set of locking contacts, and can also have none. Close contact: Hall door close, hall door close contact will be connected. Hall door open, hall door close contact will be cut off.

Locking contact： When hall door locked, hall door locking contact is connected. When hall door lock is opened, hall door locking contact is cut off.

2.1.5 BL2000-HQK： Electric bolt lock control board, installed one pcs at each floor to control the action of electric bolt lock of each landing.

2.2. Parameter setting

2.2.1 F4-06-12 sets to ON.

2.2.2 F4-06-13 sets to ON.

2.2.3 F4-06-31 sets to ON to enable hall pull door function.

2.2.4 Set F4-06-19=OFF and F4-06-20=OFF.

2.2.5 If no light curtain. Set F3-01-17=ON and F3-01-18=ON.

2.2.6 Set F4-07-02 to ON.

2.3. Wiring configuration

2.3.1 Serially connect close contact of hall door at each floor and finally connect to X31. Serially connect locking contact of hall door at each floor and finally connect to X30. If no locking contact, please connect it to close contact feedback together.

2.3.2 X31 feedback point is hall door close contact input, X30 feedback point is hall door locking contact input.

2.3.3 Install one BL2000-HQK control board at each floor and connect to HC1 communication cable. Set address of BL2000 according to physical address, the electric bolt lock is controlled by HQK directly.

2.3.4 Because there's hall door locking detection, one more cable needs to be added in shaft cable. If there's no hall door locking contact, this cable is not needed.

2.4. Time sequence

2.4.1 After elevator arrives to floor, HQK outputs unlock signal, hall door lock will be opened. If

there's locking detection, X30 will be cut off. The passenger can manually open hall door. After hall door open, X31 will be off. After hall door close, X31 will be connected, then HQK cancel unlock signal, hall door will be locked and X30 will be connected. If passenger wants to open hall door, he need to press hall call of current floor or door open button in car, then HQK will output unlock signal again.

2.4.2 After hall closes and system receives floor call command, if door lock cannot close within 10 sec (X30 door locking contact keep invalid), it will show Er31 fault. At this moment, it needs to open hall door (X31 becomes invalid) or system power off, or door locking circuit totally close, then the fault can be reset.

2.4.3 After hall door circuit X31 becomes connected and elevator stops for F2-11 setting time (min), car light will be turned off. After hall door open, the car light will recover.

2.4.4 While elevator stops and someone blocks light curtain, elevator will not run. During elevator running, if someone blocks light curtain, elevator will decelerate and stop, not sudden stop but will show Er54 fault. After light curtain recover, elevator will rescue to leveling position.

2.4.5 After hand pull door elevator stop at landing, if door is not opened, it must wait for F2-05 (Door open time), then can continue to run. The minimum time is 10 seconds. If the setting is less than 10 seconds, it will be treated as 10 seconds.

2.5. Other description

BL2000-HQK User's manual is shown in appendix.

2.6. Door lock circuit diagram

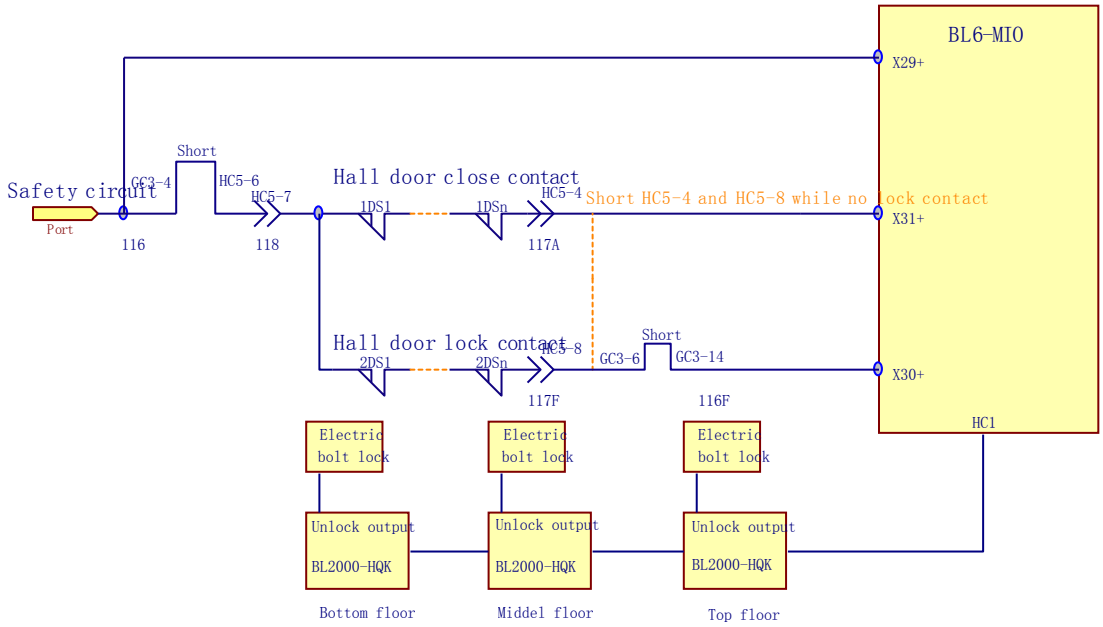


Figure F6.2 hand pull door + hall electric bolt lock

F6.3 Swing door

3.1 Hardware configuration

3.1.1 Control cabinet: NS05 villa lift control cabinet.

3.1.2 Swing door: With door motor, open door command to open door, cancel door open command then automatically close door.

3.1.3 Electric bolt lock: Can be configured or not. When electric bolt lock is installed at each floor, only when electric bolt lock is unlocked, hall door can be opened. After electric bolt lock is locked, hall door cannot be opened after hall door closed. If hall door is open, it will be locked after hall door close.

3.1.4 Car: No car door, light curtain can be installed. While light curtain is valid, elevator cannot run.

If light curtain becomes valid during elevator running, it will decelerate and stop running. Only when light curtain becomes invalid, it can recover to run. If there's no light curtain, it needs to set parameter to cancel light curtain.

3.1.5 Hall door: Hall door is swing door with locking device. Hall door must have a set of close contacts. Electric bolt lock can have a set of locking contact or have none.
Close contact: When hall door closes, close contact should be connected. When hall door opens, close contact should be cut off.
Locking contact: When hall door is locked, locking contact should be connected. When hall door is unlocked, locking contact should be cut off.

3.1.6 BL2000-HQK: Electric bolt lock control board, installed at each floor to control the action of electric bolt lock on hall door of each landing.

3.2 Parameter setting

3.2.1 F4-06-12 sets to ON.

3.2.2 F4-06-13 sets to ON。

3.2.3 F4-06-31 sets to ON to enable hand door function.

3.2.4 Set F4-06-19=OFF and F4-06-20=OFF.

3.2.5 If without light curtain, set F3-01-17=ON and F3-01-18=ON.

3.2.6 Set F4-07-02 to OFF, automatic door closing after door opening is held.

3.3 Wiring configuration

3.3.1 Serially connect close contact of hall door at each floor and finally connect to X31. Serially connect locking contact of hall door at each floor and finally connect to X30. If no locking contact, please connect it to close contact feedback together.

3.3.2 X31 feedback point is hall door close contact input, X30 feedback point is hall door locking contact input.

3.3.3 Install one BL2000-HQK control board at each floor and connect to HC1 communication cable. Set address of BL2000 according to physical address, hall door unlock signal is controlled by HQK directly, and the electric bolt lock (if have) is also controlled by HQK.

3.3.4 If there's hall door locking detection, one more cable needs to be added in shaft cable. If there's no hall door locking contact, this cable is not needed.

3.4 Time sequence

3.4.1 After elevator arrives to floor, HQK outputs unlock signal, hall door lock will be opened. If there's locking detection, X30 will be cut off. After locking device opens, HQK will output open door signal. If there's no locking detection, HQK will output open door signal 2 sec after output unlocking signal, then door will automatically open.

3.4.2 After hall door open, X31 will be off and HQK board will cancel open door signal. After presetting delay time, swing door motor will automatically close door. After hall door close, X31 will be connected, then HQK cancel unlock signal, hall door will be locked and X30 will be connected. If passenger wants to open hall door, he need to press hall call of current floor or door open button in car, then HQK will output unlock signal again.

3.4.3 After hall closes and system receives floor call command, if door lock cannot close within 10 sec (X30 door locking contact keep invalid), it will show Er31 fault. At this moment, it needs to open hall door (X31 becomes invalid) or system power off, or door locking circuit totally close, then the fault can be reset.

3.4.4 After hall door circuit X31 becomes connected and elevator stops for F2-11 setting time (min), car light will be turned off. After hall door open, the car light will recover.

3.4.5 While elevator stops and someone blocks light curtain, elevator will not run. During elevator running, if someone blocks light curtain, elevator will decelerate and stop, not sudden stop but will show Er54 fault. After light curtain recover, elevator will rescue to leveling position.

3.5 Other description

BL2000-HQK user's manual is shown in appendix.

3.6 Door lock circuit diagram

See Figure F6.2.

F6.4 BL2000-HQK-V9.2 description as swing door controller

1. Range

BL2000-HQK-V9.2 is used in villa lift for swing door or hall pull door control.

2. Port definition

Name	Position	Definition	Usage	Specification	
				Port type	Rated load
J1	J1-1	24V Power input	Power and communication port	--	150mA
	J1-2	24V Power GND		--	--
	J1-3	CAN Bus H		--	--
	J1-4	CAN Bus L		--	--
J2	J2-1	Up call answer	Up call input button and answer output	OC door	DC24V、20mA
	J2-2	24V		--	--
	J2-3	24V		--	--
	J2-4	Up call input		Resistance partial voltage	--
J3	J3-1	Down call answer	Down call input button and answer output	OC 门	DC24V、20mA
	J3-2	24V		--	--
	J3-3	24V		--	--
	J3-4	Down call input		Resistance partial voltage	--
J5	J5-1	Relay output 1	Door control relay output	Relay	DC5A24V AC5A250V
	J5-2	Relay output 2			
	J5-3	J5-1, J5-2 COM			
	J5-4	Relay output 3			
	J5-5	J5-4 COM			
	J5-6	24V	Power output	--	--
	J5-7	24V GND		--	--
J6	J6-1	Spared answer	Spared input button and answer output	OC door	DC24V、20mA
	J6-2	24V		--	--
	J6-3	24V		--	--
	J6-4	Spared input 0[Note1]		Resistance partial voltage	--
J7	J7-1	Spared answer	Spared input button and answer output	OC door	DC24V、20mA
	J7-2	24V		--	--
	J7-3	24V		--	--
	J7-4	Spared input 1[Note1]		Resistance partial voltage	--
S1	CAN communication terminal resistor jumper		P	Program port	
JC	Test jumper				
AN	Setting button		SZ	Setting jumper	
EN	Parking and fire input enable jumper. While using parking and fire input, put jumper on board of related floor.				
Note 1: Default setting is: Spared input 0 is parking input, spared input 1 is fire input.					

Door control port definition：

	J5-1（COM:J5-3）	J5-2（COM:J5-3）	J5-4（COM:J5-5）
Type 1	Door open output	Door close output	Electric bolt lock output
Type 2	Unlock and open door	Close door	Not used

3 .Control Method

Type 1:

1) For door motor: Open/close door and electric bolt lock are controlled individually.

2) Open door condition: Elevator is at door zone and isn't running without retiring cam signal in auto mode.

3) Open door type：

①After door open conditions are fulfilled, electric bolt lock will output and wait for 60s. If X30 keeps connected, it will lock again. If X30 disconnect within 60s, door open will output after 1s, then wait for 12s. If X31 keep connected, open door output will stop and lock again. If X31 disconnect within 12s, door open will output for 3s then stop. After door opens, if door is not closed during 60s or 1s after door closed, it will lock again.

②If door open conditions are not fulfilled, electric bolt lock will power off and lock, keep door close output.

Note 1： After receiving open door signal from integrated controller, it will open door.

Note 2： Integrated controller need to be set to manual door mode.

Type 2:

1) For door motor: Automatic unlock and open door.

2) Open door condition: Elevator is at door zone and isn't running without retiring cam signal in auto mode.

3) Open door type：

① After door open conditions are fulfilled, unlock & open will output for 5s and then stop output. Swing door motor will control unlocking and opening automatically. After open door output for 5s, close door output becomes valid. During door open output holding, close door input in car is valid.

②If door open conditions are not fulfilled, Unlock & open and close door will have no output at current floor, and it will keep door close output at other floor.

Note 1:After receiving open door signal from integrated controller, it will open door.

Note 2:Open door output time and door open holding time are 5s in default setting and can be set to 5~14 s.

Appendix 7 Forced Drive Mode Elevator Instruction

Note: 7X26 and later version (includes 26) has Forced Drive mode.

When elevator is forced drive mode, thus, in mechanical perspective there is no counterweight, and the elevator system is equivalent to windlass.

In order to provide more comfortable starting, system usually adopts weighting device and no-load compensation methods to compensate torque during starting.

Parameter 1：F9-11[Comp Enable] =1；

Parameter 2：F9-00[Max Torq Comp] =adjust according to actual condition；

Parameter 3：F9-21[FULL Comp Pro] = adjust according to actual condition.

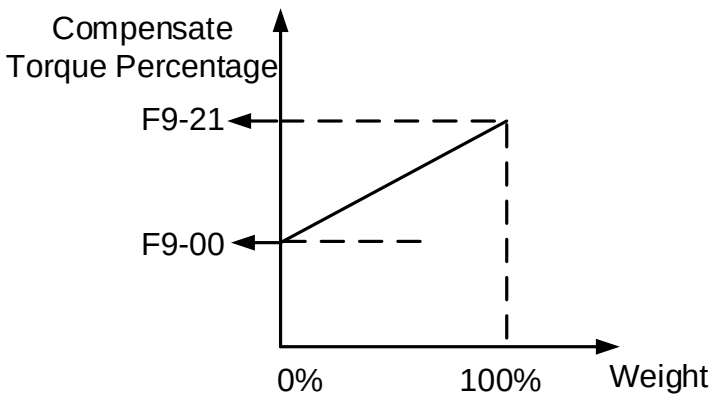


Figure F20.1 Forced Drive Torque Pre-apply Schematic Diagram

Adjust method:

1. When light load, adjust F9-00 so that the car does not slip in light loaded. Adjustment rule: open the brake, if car slips down, then increase F9-00; otherwise reduce F9-00.
2. When full load, adjust F9-21 so that the car does not slip in full loaded. Adjustment rule: open the brake, if car slips down, then increase F9-21; otherwise reduce F9-21.

According to the **Forced Drive Torque Pre-apply Schematic Diagram**, the starting torque is single direction in forced drive mode.

When weight is 0%, elevator system has balancing torque = F9-00*Motor Rated Torque/100；

When weight is 100%, elevator system has balancing torque = F9-21 *Motor Rated Torque /100.

Appendix 8. Auto rescue for villa lift

F8.1 Passenger trapped problem for villa lift

Passenger trapped reason analysis for villa lift：

1、 When passenger takes the lift, during normal running power grid suddenly break, the car may stop at non-leveling position and cannot continue to run.
2、 During lift normal running, the control system finds fault, which effect lift running and cannot automatically reset, or important component damaged which will cause lift sudden stop at non-leveling position and cannot automatically rescue.

Difficulty of rescuing trapped passenger for villa lift：

1、 For trapped reason 1, it can perform rescue by emergency power which built in control system.
2、 For trapped reason 2, even with additional emergency power it cannot perform automatic rescue to escape, because there may be mechanical fault or current conditions cannot meet the rescue drive requirement.
3、 Because it is private villa lift, property management personnel or lift maintenance engineer cannot reach the site at first time and perform rescue in time.
4、 Although there's manual rescue device in cabinet, but no one at home or the host don't know how to operate it.

F8.2 NS05 Villa Lift Solution

For passenger trapped problem for villa lift, NS05 villa lift control system supplies a set of complete auto rescue solution.

1、 Passenger trapped by power break

Bluelight villa lift control cabinet has built-in ARD device. Once power break and passenger trapped, ARD emergency power will automatically switch in and help free the passenger without manual operation. And it will automatically power off after rescue complete to avoid battery to deep discharge.

2、 Passenger trapped by fault

Most fault of control system can automatically reset. Only in some special conditions, such as inverter fault, encoder fault and other unrecoverable faults or component damage, it may cause motor cannot be driven and cause passenger trapped. Unless car jamming or brake cannot open, the lift with trapped passenger can be moved to leveling position to perform rescue. One button rescue function has been designed by our company. When passenger is trapped, he can manually operate button in car to force brake open, and automatically rescue to leveling position in the way of star-seal sliding with unbalance load (Star-sealed sliding speed is low),and finally automatically open door to free passenger.

Detail process：

1） After start this function, elevator is in auto mode and at non-leveling position. If it stops overtime, system will judge passenger trapped (bypass auto-reset fault in short time), then elevator will enter to ARD status.

2） After entering ARD status, the rescue voice will be broadcasted in car, to appease passenger and prompt passenger the operation process of one button rescue. This voice will broadcast in loop until rescue complete.

3） In this status, rescue button in car will be active. Button will flicker for notification. When the button is pressed, it keeps light on. When the button is released, it recovers to flicker. If it isn't under rescue status, rescue button will not light on and will be meaningless when pressed.

4） To ensure the safety during rescue operation, the button is designed to non-trigger type (When keep pressing, elevator will perform auto rescue, when release, it will stop immediately). The advantage is to avoid accident during running, if there's no car wall and passenger has scratched with shaft wall, releasing button can cause stop in time.

5） It will force brake to open during auto rescue, control system keeps output star-sealed status, and the car will move slowing in constant speed by unbalance drive force and inhibition of star-sealed. If it judges current floor as non-stoppable floor, elevator will continue to move to next stoppable floor.

6） During sliding, control system still has protection function. If sliding speed is too high, or runs overtime, it will be judged as overspeed or overtime fault. For safety, it will turn brake off immediately after abnormal condition and stop running.

7） After sliding to leveling position, it will stop running and keep door open(release retiring cam for manual door), the voice announcement will notice passenger to leave elevators quickly as possible, then complete one button rescue process.

F8.3 Software and hardware configuration

1、Program description

This function is directed against NS05 villa lift control system. This function is built since 7304 version, default setting is ON. During rescue process, it needs to configure Bluelight voice announcement to notice rescue operation. The program of voice announcement also needs to upgrade. Individual voice announcement supports rescue voice since 694_07 version. TFT 7 inch LCD ingrates voice announcement, which need to download 3 programs. These 3 programs which support rescue voice are 390_16, 390_17 and 390_18.

2、Wiring description

Normally villa lift don't use door open delay button, so rescue button in car can use this button. J3 of ZLB is open delay, customer may connect rescue button to J3-3 and J3-4, and connect rescue button light to J3-1 and J3-2.

Special description：

1、Above function don't support auto rescue operation with safety circuit (include safety circuit and door circuit) disconnected.

2、For balance load condition or using geared motor (no star-sealed) for villa lift, if passenger trapped because of fault, one button rescue function will be unavailable.。

3、Emergency rescue function is the standard configuration of NS05 villa lift control system. The one button rescue function need to be configured with Bluelight voice announcement. Please consult detail with our salesman.

4、Rescue function is set to ON by default, open delay is taken as rescue button. If open delay button is needed, please set F4-06-17=OFF to disable rescue function, then open delay function will be recovered. Rescue function and open delay function can't be enabled together.