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1.2 Specifications

Specifications of BL6-U Series Integrated Controller for home lift in chart 1.

CHART 1.1 SPECIFICATIONS

MODEL BL6—U□40□□-CH		4002	4003	4005
MAX MOTOR CAPACITY(KW)		2.2	3.7	5.5
RATED OUTPUT	RATED OUTPUT CAPACITY(KVA)	4.0	5.9	9
	RATED OUTPUT CURRENT(A)	5.5	9	14
	MAX OUTPUT VOLTAGE(V)	Three-phase, AC380(corresponding to the input voltage)		
	RATED FREQUENCY(Hz)	50		
	MAX OUTPUT FREQUENCY(Hz)	120		
POWER INPUT	RATED VOLTAGE(V)	Three-phase, AC380		
	RATED FREQUENCY(Hz)	50		
	RATED INPUT CURRENT(A)	6.5	11	17
	ALLOWABLE VOLTAGE FLUCTUATION	±15%		
	ALLOWABLE FREQ FLUCTUATION	±5%		
MODEL BL6—U□20□□-CH		2002	2003	
MAX MOTOR CAPACITY(KW)		2.2	3.7	
RATED OUTPUT	RATED OUTPUT CAPACITY(KVA)	4	7	
	RATED OUTPUT CURRENT(A)	11	17.5	
	MAX OUTPUT VOLTAGE(V)	Three-phase, AC220(corresponding to the input voltage)		
	RATED FREQUENCY(Hz)	50		
	MAX OUTPUT FREQUENCY(Hz)	120		
POWER INPUT	RATED VOLTAGE(V)	Three-phase, AC220V		
	RATED FREQUENCY(Hz)	50		
	RATED INPUT CURRENT(A)	12.5	21	
	ALLOWABLE VOLTAGE FLUCTUATION	+10%, -15%		
	ALLOWABLE FREQ FLUCTUATION	±5%		
BASIC FEATURES	ELEVATOR CONTROL MODE	All Selective Collective		
	ELEVATOR SPEED RANGE	≤1m/s		
	APPLICABLE HIGHEST FLOORS	6 levels		
	APPLICABLE ELEVATOR TYPE	Home Lift		
	APPLICABLE MOTOR	Gear Traction Machine, Gearless Traction Machine		
	COMMUNICATION MODE	CAN bus serial communication		
	LEVELING ACCURACY	≤3mm		

CHART 1.1 SPECIFICATIONS (Cont'd)

DRIVE CONTROL FEATURES	CONTROL MODE	Space vector PWM (SVPWM) closed loop vector control
	CARRIER FREQUENCY	8KHz (6~12KHz adjustable)
	SPEED CONTROL RANGE	1:1000
	SPEED CONTROL ACCURACY	±0.05% (25°C±10°C)
	SPEED RESPONSE	30Hz
	TORQUE LIMIT	Yes (Set by parameters)
	TORQUE ACCURACY	±5%
	FREQUENCY CONTROL RANGE	0~120Hz
	FREQUENCY ACCURACY	Digital Ref: ±0.01% (-10°C~+40°C)
	FREQUENCY REF RESOLUTION	Digital Ref: 0.01Hz
	OUTPUT FREQ RESOLUTION	0.01Hz
	OVERLOAD CAPACITY	150% rated current 60S; 180% rated current 10S
	STARTING TORQUE	180% rated current 0Hz
	DECELERATION TIME	0.001~600s
MAIN CONTROL FUNCTIONS	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 STOPS ; INTERNAL BRAKE, PG FREQ DIVIDING OUTPUT, AUTOMATIC FAULT RETRY, AUTOMATIC FAULT RESET, PARAMETER COPY	
CONTROL/INPUT/OUTPUT INTERFACE	OC INPUT CONTROL POWER	ISOLATED EXTERNAL DC24V
	RELAY OUTPUT CONTROL POWER	ISOLATED INTERNAL DC24V
	LOW OPTO-ISOLATED INPUTS	17-CHANNEL SWITCHES:RATED LOAD 7MA/DC24V,UPPER FREQ 100HZ
	HIGH OPTO-ISOLATED INPUTS	3-CHANNEL SWITCHES:RATED LOAD 8MA/AC110V,UPPER FREQ 100HZ
	PROGRAMMABLE RELAY OUTPUT	6 CHANNELS:1NO, CONTACT CAPACITY 5A/30VDC,5A/250VAC
	CAN COMMUNICATION INTERFACE	1 CHANNELS:(LOP/COP, REMOTE WIRELESS MONITORING)
	RS232 COMMUNICATION INTERFACE	1 CHANNEL: DIGITAL OPERATOR/PC MONITORING/PROGRAMMABLE INTERFACE
DISPLAY	DIGITAL OPERATOR	LCD DISPLAY IN CHINESE/ENGLISH
	MONITORING SOFTWARE INTERFACE	MENU/PARAMETER/STATE/VARIABLE TIMING/DIGITAL OSCILLOSCOPE ETC.

CHART 1.1 SPECIFICATIONS (Cont'd)

MAIN PROTECTION FUNCTIONS	INSTANTANEOUS OVERCURRENT PROTECTION	STOP AT OVER 200% RATED OUTPUT CURRENT
	FUSE PROTECTION	STOP AT FUSED
	OVERLOAD PROTECTION	STOP AT 150% RATED CURRENT 60S/180% RATED CURRENT 10S
	OVERVOLTAGE PROTECTION	STOP AT DC BUS VOLTAGE OVER 780V (FOR 400V DRIVE)/ 410V (FOR 200V DRIVE)
	UNDERVOLTAGE PROTECTION	STOP AT DC BUS VOLTAGE UNDER 380V (FOR 400V DRIVE)/ 190V (FOR 200V DRIVE)
	HEATSINK OVERHEAT PROTECTION	PROTECT BY THERMISTORS
	IPM INTERNAL PROTECTION	IGBT OVERCURRENT/OVERHEAT/SHORT CIRCUIT/UNDERVOLTAGE PROTECTION
	MOTOR PROTECTION	PROTECT BY ELECTRONIC THERMAL DEVICES
	IMPACT RESTRAINING CIRCUIT	PROTECT BY CONTACTOR FEEDBACK
	OVERSPEED 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
	MAIN PROTECTION FUNCTIONS	SAFETY CIRCUIT FAULT
BRAKE FAULT		NO BRAKE OPEN FEEDBACK SIGNAL AFTER OUTPUT BRAKE OPEN COMMAND
LEVELING ZONE SIGNAL FAULT		PROTECT AT LEVELING ZONE SIGNAL FAULT
OUTPUT CONTACTOR FAULT		PROTECT AT OUTPUT CONTACTOR FAULT
RUNNING TIME PROTECTION		PROTECT AT SINGLE RUNNING TIME EXCEEDS LIMIT
MAIN PROTECTION FUNCTIONS	FLOOR COUNTER 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	CABINET EMBEDDED INSTALLATION/HANGING INSTALLATION
USING AMBIENT	AMBIENT TEMPERATURE	-10°C ~ +40°C
	HUMIDITY	5 ~ 95% RH, NO CONDENSATION
	STORAGE TEMPERATURE	-20°C ~ +60°C
	APPLICATION SITUATION	INDOOR (NO CORROSIVE GAS, FLAMMABLE GAS, DUST AND DIRECT SUNLIGHT)
	ALTITUDE	BELOW 1000M
	VIBRATION	10~20HZ, <9.8M/S ² ; 20~50HZ, <2M/S ²

2 Dimensions of BL6-U Series Integrated Controller for home lift

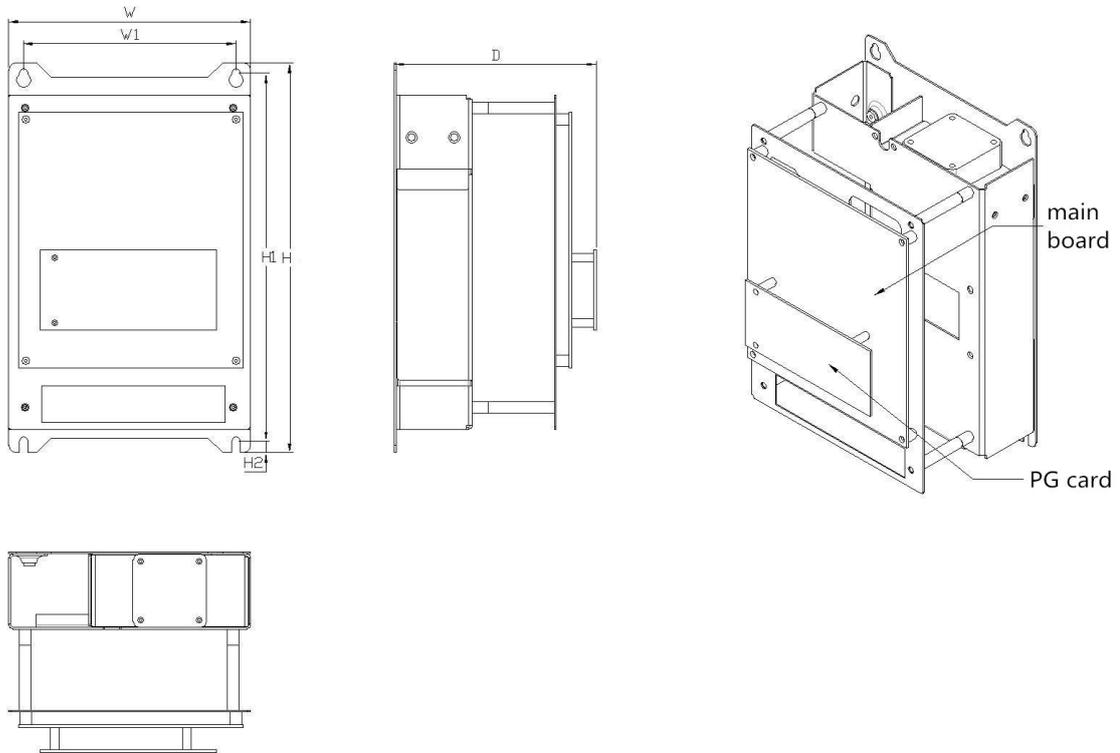


FIGURE 2.1 INSTALLATION DIMENSIONS OF OPEN TYPE INTEGRATED CONTROL

CHART 2.1 DIMENSIONS OF OPEN TYPE CONTROLLER

Voltage Level	Max Motor Capacity (KW)	Model	Diagram	Dimensions						Weight (kg)
				W	H	D	W1	H1	H2	
400V (3-Phase)	2.2	BL6-UO4002-CH	Figure 2.1	165	268	155	145	253	8	3.5
400V (3-Phase)	3.7	BL6-UO4003-CH	Figure 2.1	200	290	175	170	275	8	5.6
400V (3-Phase)	5.5	BL6-UO4005-CH	Figure 2.1	200	290	175	170	275	8	5.6
200V (3-Phase/1-Phase)	2.2	BL6-UO2002-CH	Figure 2.1	165	268	155	145	253	8	3.5
200V (3-Phase/1-Phase)	3.7	BL6-UO2003-CH	Figure 2.1	200	290	175	170	275	8	5.6

3 Terminals of BL6-U Series Integrated Controller for home lift

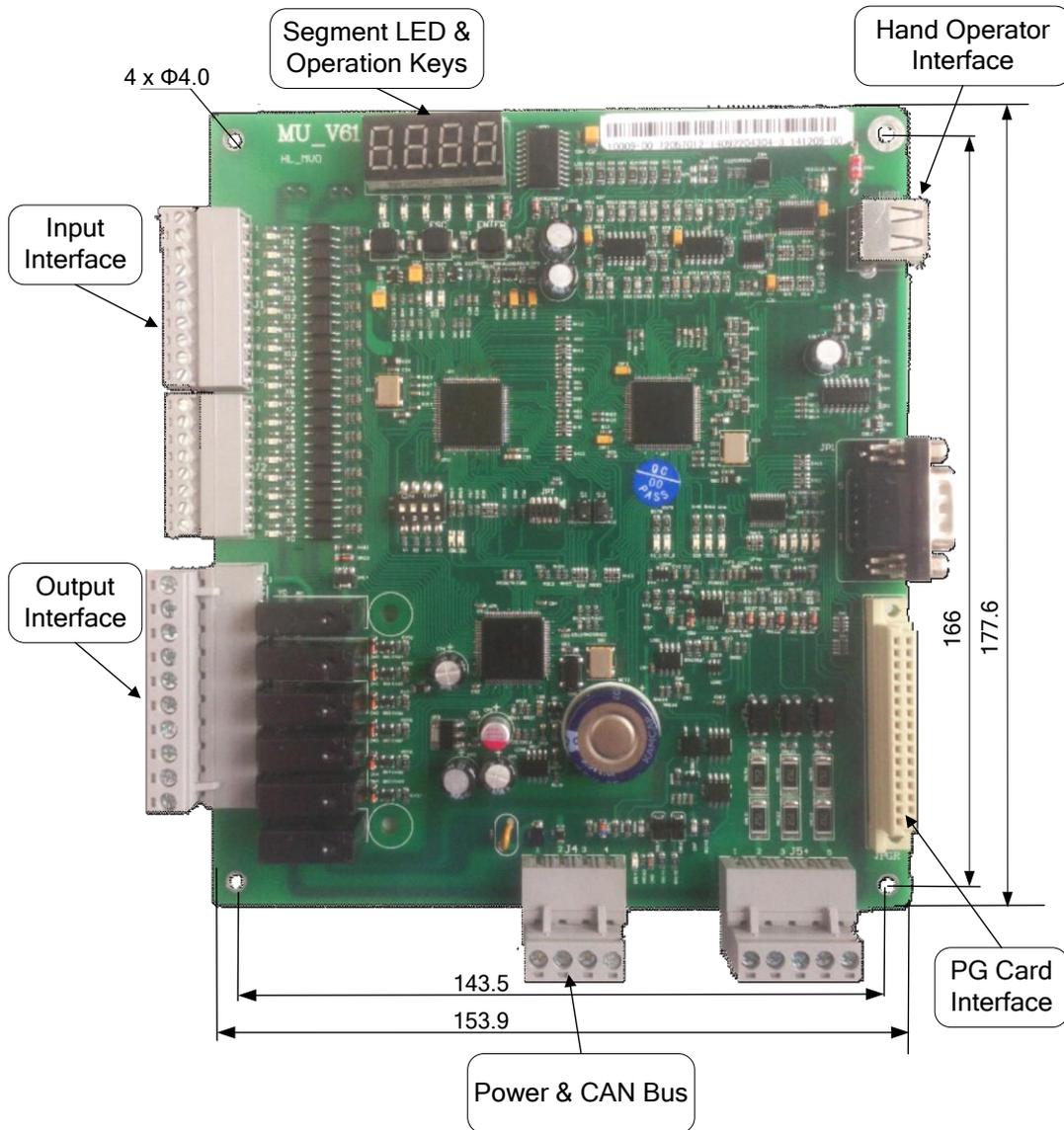


FIGURE 3.1 TERMINAL ARRANGEMENTS FOR CONTROL CIRCUIT

CHART 3.1 Control Circuit Port definition and Function

Port No.	Terminal Symbol	Location	Definition	Usage	Interface Tech Spec			
					Interface Type	Rated Capacity	On/off Time	Max Speed
J1	--	J1-1	Unused	Input	OC	DC24V 7mA	10mS	100Hz
	X16	J1-2	Running contactor input					
	X15	J1-3	Right brake feedback input					
	X14	J1-4	Door inter-lock input					
	X13	J1-5	Emergency stop input					
	X12	J1-6	Fireman input					
	X11	J1-7	SC contactor feedback					
	X10	J1-8	Down-leveling input					
	X9	J1-9	Up-leveling input					
	X8	J1-10	Bottom terminal 1 input					

CHART 3.1 Control Circuit Port definition and Function (Cont'd)

Port No.	Terminal Symbol	Location	Definition	Usage	Interface Tech Spec			
					Interface Type	Rated Capacity	On/off Time	Max Speed
J2	X7	J2-1	Top terminal 1 input	Input	OC	DC24V 7mA	10mS	100Hz
	X6	J2-2	Left brake feedback input					
	X5	J2-3	Brake contactor feedback input					
	X4	J2-4	Heat sensor input					
	X3	J2-5	Emergency leveling running input					
	X2	J2-6	Down running input					
	X1	J2-7	Up running input					
	X0	J2-8	Inspection input					
J3	COM0	J3-1	Y0 common terminal	Output	Relay	DC 10A30V AC 10A250V	5/10mS	20cpm
	Y0	J3-2	Cut main contactor output					
	COM1	J3-3	Y1 common terminal					
	Y1	J3-4	UPS power cut output					
	COM2	J3-5	Y2~Y5 common terminal					
	Y2	J3-6	Brake economy resistor output					
	--	J3-7	--					
	Y3	J3-8	Brake control output					
	Y4	J3-9	SC contactor control output					
	Y5	J3-10	Running contactor control output					
J4	+24V	J4-1	Input power supply	Power	Power	DC 24V 10A	--	--
	GND IN	J4-2	Input Ground					
	0L	J4-3	HOP/COP communications -	COMM Interface	CAN	80mA	--	25KH
	0H	J4-4	HOP/COP communications+					
J5	X30-/X31-	J5-1	Door inter-lock input- / Landing Door short detection1 -	Safety Circuit Detection	High voltage	AC110V 5mA	10mS	100Hz
	X31+	J5-2	Landing Door short detection1+					
	X30+	J5-3	Door inter-lock input +					
	X29-	J5-4	Emergency stop input-					
	X29+	J5-5	Emergency stop input+					

Note:

1. Please notice Y6 and Y7 terminal has been exchanged, compared with BL3. So, the port of BL6 has no compatibility with BL3;
2. Definition of DIP switches: Normally, please set all 4 DIP switches to OFF status.

4 PG Card Terminals & Assemblage

Note: With the hardware version upgrade, the corresponding pictures may be changed. Reference to prevail in kind.

4.1 PG_V6

PG_V6 interface card is sync/async machine universal pulse encoder speed feedback and frequency dividing output card.

PG_V6 is in supporting use of 5V line driver output type encoder. Encoder for async machine: A/B, and encoder for sync machine: A/B/Z/U/V/W.

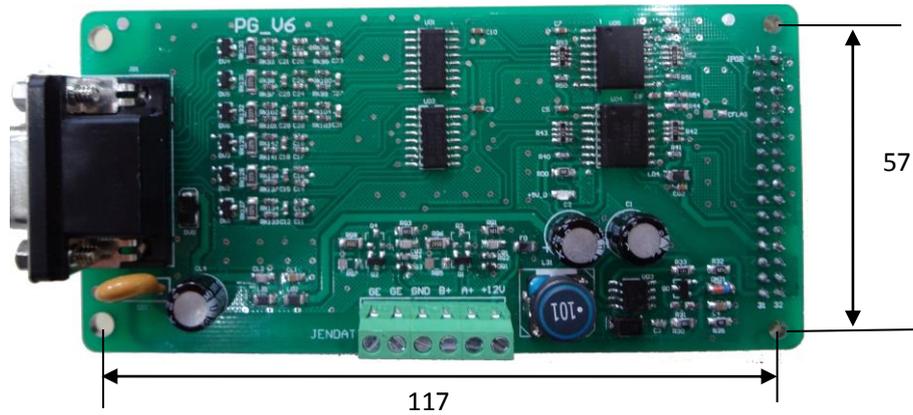


FIGURE 4.1 PG_V6 CARD

CHART 4.1 PG-V6 Card Port definition and Function

Port No.	Terminal Symbol	Location	Definition	Usage	Interface Tech Spec			
					Interface Type	Rated Capacity	On/off Time	Max Speed
JENDATA (short for JEN)	+12V	JEN-1	OC/ Push-pull type power	12V power	Power output	+150Ma/12V±5%		
	A+	JEN-2	Freq dividing signal OC output A	Sync freq dividing	OC/ Push pull output	±50Ma		500KHz
	B+	JEN-3	Freq dividing signal OC output B	Sync freq dividing	OC/ Push pull output	±50Ma		500KHz
	0V	JEN-4	Power ground	Power ground	Power ground	—		
	GE	JEN-5	Shield ground	Shield ground		—		
	GE	JEN-6	Shield ground	Shield ground		—		
JG1	+5V	JG1-1	+5V	5V Power	Power output	+400Ma/5V±5%		
	U+	JG1-2	U+	differential signal U+	differential input	±20Ma/3.1-5V		500KHz
	Z+	JG1-3	Z+	differential signal Z+	differential input	±20Ma/3.1-5V		500KHz
	B+	JG1-4	B+	differential signal B+	differential input	±20Ma/3.1-5V		500KHz
	A+	JG1-5	A+	differential signal A+	differential input	±20Ma/3.1-5V		500KHz
	GND	JG1-6	GND	5V ground	Power ground	—		
	U-	JG1-7	U-	differential signal U-	differential input	±20Ma/3.1-5V		500KHz
	Z-	JG1-8	Z-	differential signal Z-	differential input	±20Ma/3.1-5V		500KHz
	B-	JG1-9	B-	differential signal B-	differential input	±20Ma/3.1-5V		500KHz
	A-	JG1-10	A-	differential signal A-	differential input	±20Ma/3.1-5V		500KHz
	GND	JG1-11	GND	5V ground	Power ground	—		
	V+	JG1-12	V+	differential signal V+	differential input	±20Ma/3.1-5V		500KHz
	V-	JG1-13	V-	differential signal V-	differential input	±20Ma/3.1-5V		500KHz
	W+	JG1-14	W+	differential signal W+	differential input	±20Ma/3.1-5V		500KHz
W-	JG1-15	W-	differential signal W-	differential input	±20Ma/3.1-5V		500KHz	

4.2 PG_V6X

PG_V6X interface card is async machine universal pulse encoder speed feedback and frequency dividing output card.

PG_V6X is in supporting use of 12V OC output and push-pull output type pulse encoder. Encoder for async machine: A/B.

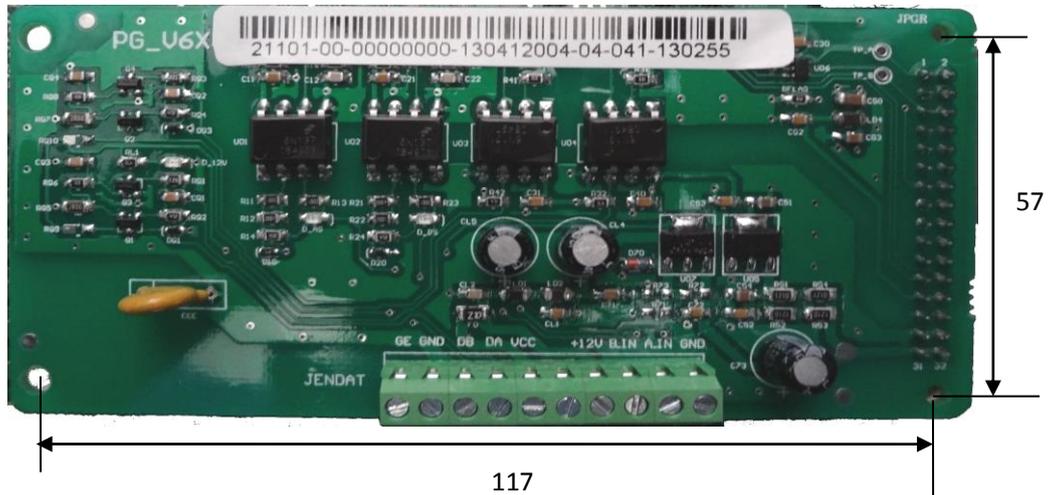


FIGURE 4.2 PG_V6X CARD

CHART 4.2 PG-V6X Card Port definition and Function

Port No.	Terminal Symbol	Location	Definition	Usage	Interface Tech Spec			
					Interface Type	Rated Capacity	On/off Time	Max Speed
JENDATA (short for JEN)	0V	JEN-1	Power ground	Power ground	Power ground	—		
	IA	JEN-2	OC/ Push-pull type A phase input	Input signal A	OC/ Push pull input	-10Ma/12V-15V		500KHz
	IB	JEN-3	OC/ Push-pull type B phase input	Input signal B	OC/ Push pull input	-10Ma/12V-15V		500KHz
	+12V	JEN-4	OC/ Push-pull type power	12V Power supply	Power output	+150Ma/12V±5%		
		JEN-5						
	+12V	JEN-6	OC/ Push-pull type power	12V Power supply	Power output	+150Ma/12V±5%		
	A+	JEN-7	Freq dividing signal OC output A	Sync freq dividing	OC/ Push pull output	±50Ma		500KHz
	B+	JEN-8	Freq dividing signal OC output B	Sync freq dividing	OC/ Push pull output	±50Ma		500KHz
	0V	JEN-9	Power ground	Power ground	Power ground	—		
	GE	JEN-10	Shield ground	Shield ground		—		

4.3 SPG_V6

SPG_V6 interface card is sync/async machine universal sine cosine encoder speed feedback and frequency dividing output card.

SPG_V6 is in supporting use of 5V line driver output type sine cosine encoder. Encoder for async

machine: A/B, and encoder for sync machine: A/B/R/C/D.
Refer to Figure 4.3 below for detail.

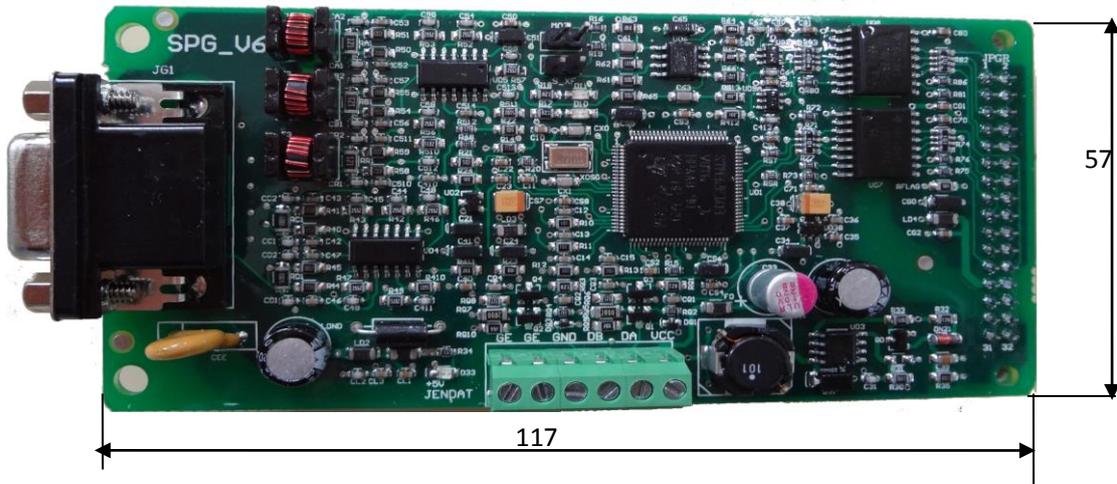


FIGURE 4.3 SPG_V6 CARD

CHART 4.3 SPG_V6 Interface card Port definition and Function

Port No.	Terminal Symbol	Location	Definition	Usage	Interface Tech Spec			
					Interface Type	Rated Capacity	On/off Time	Max Speed
JENDAT (short for JEN)	+12V	JEN-1	OC/Push-pull type power	12V Power supply	Power output	+150mA/12V±5%		
	A+	JEN-2	Freq dividing signal OC output A	Sync freq dividing	OC/Push pull output	±50mA		500KHz
	B+	JEN-3	Freq dividing signal OC output B	Sync freq dividing	OC/Push pull output	±50mA		500KHz
	0V	JEN-4	Power ground	Power ground	Power ground	—		
	GE	JEN-5	Shield ground	Shield ground		—		
	GE	JEN-6	Shield ground	Shield ground		—		
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 ground	Power ground			
	B+	JG1-8	B+	differential signal B+	differential input			40KHz
	5V	JG1-9	+5V	5V Power supply	Power output	500mA/5V±2.5% Voltage ripple lower 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	—	—	—				

5 Main control boards supporting Integrated Controller

5.1 COP (Cabin computer board)

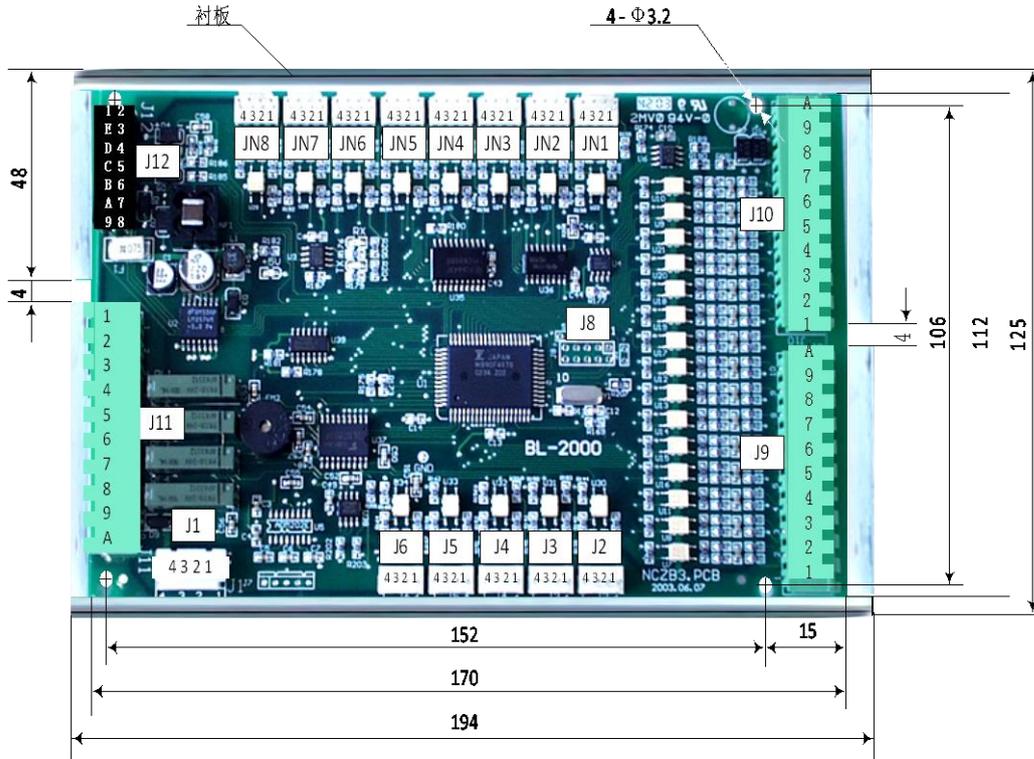


FIGURE5.1 CABIN computer board

CHART 5.1 COP BL2000-CZB terminal definitions and specifications

Port No.	Port	Location	Definition	Usage	Interface Tech Spec		
					Interface Type	Rated Capacity	Max Speed
J1	J1-1	J1-1	24V input	Power & COMM Interface			
	J1-2	J1-2	24V input ground				
	J1-3	J1-3	CAN bus H				
	J1-4	J1-4	CAN bus L				
J2	J2-1	J2-1	Door open button 1 answer	Door open button 1 & Door open button 1 answer	OC gate	Current limiting resistor 560Ω	
	J2-2	J2-2	24V output				
	J2-3	J2-3	24V output ground		Optocoupler	8mA	
	J2-4	J2-4	Door open button 1 input				
J3	J3-1	J3-1	Door close button 1 answer	Door close button 1 & Door close button 1 answer	OC gate	Current limiting resistor 560Ω	
	J3-2	J3-2	24V output				
	J3-3	J3-3	24V output ground		Optocoupler	8mA	
	J3-4	J3-4	Door close button 1 input				

CHART 5.1 COP BL2000-CZB terminal definitions and specifications (Cont'd)

Port No.	Port	Location	Definition	Usage	Interface Tech Spec		
					Interface Type	Rated Capacity	Max Speed
J4		J4-1	Door open button 2 answer	Door open button 2 & Door open button 2 answer (for two doors)	OC gate	Current limiting resistor560Ω	
		J4-2	24V output				
		J4-3	24V output ground		Optocoupler	8mA	
		J4-4	Door open button 2 input				
J5		J5-1	Door close button2 answer	Door close button 2 & Door close button 2 answer (for two doors)	OC gate	Current limiting resistor560Ω	
		J5-2	24V output				
		J5-3	24V output ground		Optocoupler	8mA	
		J5-4	Door close button 2 input				
J6		J6-1	Open delay button answer	Open delay button & Open delay button answer (optional function)	OC gate	Current limiting resistor560Ω	
		J6-2	24V output				
		J6-3	24V output ground		Optocoupler	8mA	
		J6-4	Open delay button input				
J7		J7-1	RS232 Receive	RS232 COMM	RS232 level		
		J7-2	RS232 Transmit				
		J7-3	Signal ground				
		J7-4	RS232 Output control				
		J7-5	RS232 Input control				
J8	Programming interface						
J9	CMM	J9-1	Common terminal	Input	Optocoupler	8mA	500Hz
	KMV1	J9-2	Door open limit input				
	GMV1	J9-3	Door close limit input				
	KAB1	J9-4	Door safety plate 1 input				
	CZ	J9-5	Over-load input				
	MZ	J9-6	Full-load input				
	KAB2	J9-7	Door safety plate 2 input				
	QZ	J9-8	Light-load input				
	KZ	J9-9	No load input				
	SZH	J9-10	Attendant input				
J10	SZY	J10-1	Special Use Input	Input	Optocoupler	8mA	500Hz
	SZS	J10-2	Bypass drive input				
	ZHS	J10-3	Attendant direct up				
	ZHX	J10-4	Attendant direct down				
	KMV2	J10-5	Door open limit 2 input				
	GMV2	J10-6	Door close limit 2 input				
	RT-	J10-7	Serial load detection communication line RT-	SJT-150 Serial input	RS485		
	RT+	J10-8	Serial load detection communication line RT+				
	24V	J10-9	+24V				
	CMM	J10-10	0V				

CHART 5.1 COP BL2000-CZB terminal definitions and specifications (Cont'd)

Port No.	Port	Location	Definition	Usage	Interface Tech Spec		
					Interface Type	Rated Capacity	Max Speed
J11	BLV-	J11-1	Arrival Gong 1A	Output	Relay	DC5A24V AC5A250V	20cpm Off/On Time ≤ 5/10mS
	BLV+	J11-2	Arrival Gong 1B				
	N1	J11-3	Illumination control A				
	ZM	J11-4	Illumination control B				
	BK1	J11-5	Spare 1A				
	BK2	J11-6	Spare 1B				
	CZD	J11-7	Over-load indicator lamp A				
	CM M	J11-8	Over-load indicator lamp B				
	24V	J11-9	Auxiliary +24V input	Input			
	0V	J11-10	Auxiliary 0V input				
J12	24V	J12-1、 2	Power +24V input	Car call extended cascade			
	5V	J12-3、 4	Power +5V input				
	0V	J12-5、 6	Power 0V input				
		J12-7~ 12	Data signal lines				
		J12-13、 14	standby				
JN1 ~ JN8		JNn-1	Answer output	1~8 levels Car call input/Answer output	OC gate	DC24V 20mA Current limiting resistor 560Ω	
	24V	JNn-2	+24V				
	0V	JNn-3	ground				
		JNn-4	Car call input		Optocoupler	DC24V6mA	50Hz

5.2 COP extended board

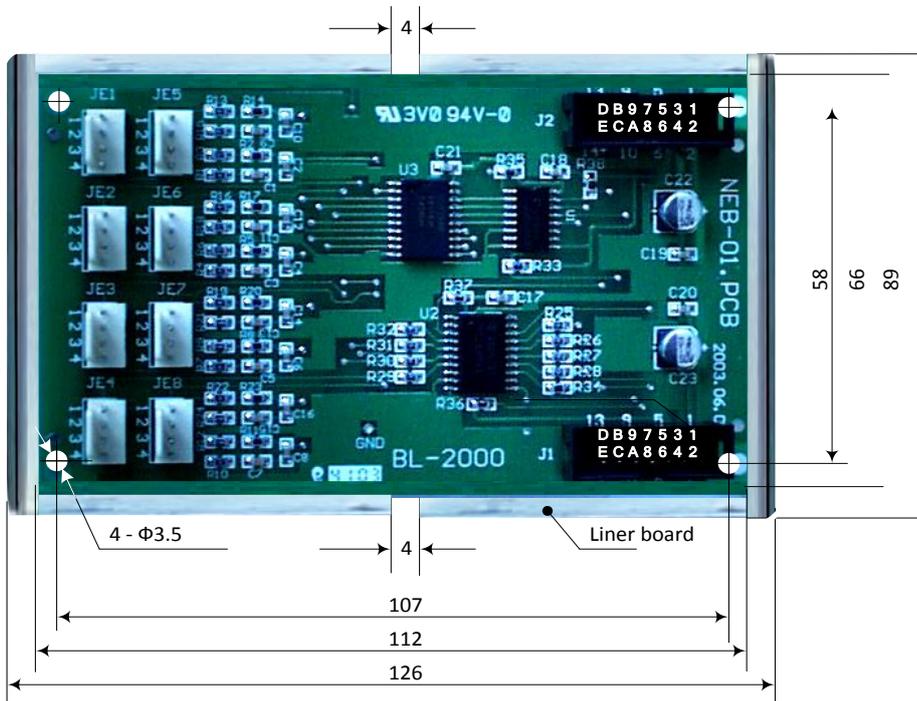


FIGURE 5.2 CABIN computer board

CHART 5.2 COP extended board BL2000-CEB terminal definitions and specifications

Port No.	Port	Location	Definition	Usage	Interface Tech Spec		
					Interface Type	Rated Capacity	Max Speed
J1	24V	J1-1, J1-2	Power +24V input	Cascade interfaces with upper board			
	5V	J1-3, J1-4	Power +5V input				
	0V	J1-5, J1-6	Power 0V input				
		J1-7~J1-12	Data signal lines				
		J1-13, J1-14	blank				
J2			Same as J1	Cascade interfaces with lower board			
JEN		JEn-1	Answer output	Car call input & answer output interface from 8i+1 to 8i+8 levels	OC gate	DC24V 20mA Current limiting resistor 560Ω	
	24V	JEn-2	+24V				
	24V	JEn-3	+24V				
		JEn-4	Car call input		Optocoupler	DC24V6mA	50Hz
Remark	"i" is cascade location where extended board stands.						

6 BL6-U Series Integrated Controller for home lift Test Commissioning



6.1 Parameter Need to set before Inspection Run

Note: Parameters must be saved after setting operation, otherwise the original value will be saved after power off.

FIGURE 6.1 Parameter Need to set before Inspection Run

Parameter List			Setup Method	
	Parameter No.	Name	Use BL Sync-machine	Use Non-BL Sync-machine
Automatic Generate	F5-00	Motor Type	In blue-light machine input, these parameters can generate automatically, see instructions below for detail.	0: Sync machine, 1: async machine. Fill in according to actual situation.
	F5-01	Poles		Follow motor nameplate
	F5-02	Sync Frequency		Follow motor nameplate
	F5-03	Rated Power		Follow motor nameplate
	F5-04	Rated Speed		Follow motor nameplate
	F5-08	Motor rated current		Follow motor nameplate
	F8-00	Encoder PPR		Base on site condition
	F8-02	PG card Type	PG card type (0: Incremental encoder, 1: Sine/Cosine encoder)	
Manual Input based on Site Condition	F1-00	Car Speed	Base on site condition	
	F1-01	Motor Speed	Motor speed at elevator rated speed (calculated)	
	F5-09	No-Load Current	Only for asynchronous machine; no need to set synchronous machine. normally set for 25%-40% of rated current.	
	F5-10	Rated Slip	Only for asynchronous machine; no need to set synchronous machine. Setting according to actual situation. Calculation method: Rated Slip = rated frequency -(rated speed * pole pairs/60). e.g.: The motor rated slip is50- (1440*2/60) =2Hz, when motor frequency is 50Hz, rated speed is 1440rmp, and motor type is four-pole motor.	
	F6-03	DirSel (direction select)	Select according to the motor installation direction in actual situation, Select motor running direction (0/1: Motor rotates anti- clockwise, car move down/up).	
	F9-11	Load Comp Enable	Load Compensation: 1 enable; 0 Unable. If use incremental encoder set this to 1; if use 1387 encoder at no-weighing mode, set this to 0.	

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.

Motor parameters automatically generated:

Enter the “BL Machine Input” interface as shown below from the main menu. Press [LEFT] or [RIGHT] key to move the cursor left or right cyclically. Press [UP] or [DOWN] key to set the content of the pointed area. 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 below

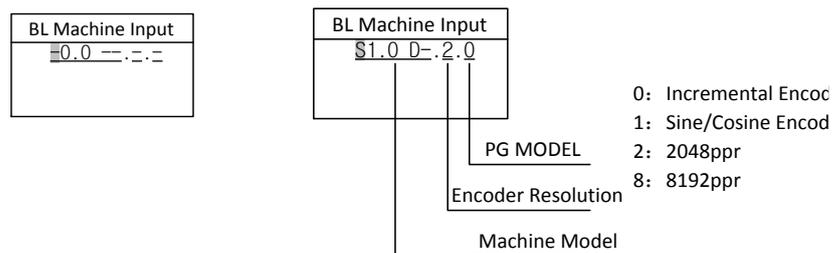


FIGURE 6.1 BL Machine Input Interface

Press OK button after entering complete motor and encoder information. BL series integrated controller automatically generate motor parameters corresponding to current motor model. Wait to exit the interface until prompting success. Then save the parameters.

If motor model entered invalid, or information entered incompletely (for example, only input the motor model but did not enter the encoder information), interface will indicate “Invalid model”. Please conform model and encoder information is correct before proceeding.

Try again if interface indicates fail.

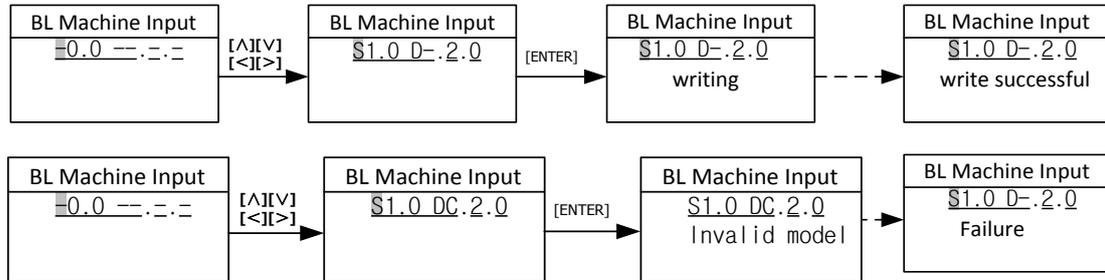


FIGURE 6.2 BL Machine Input Interface

6.2 Motor Initial Angle Tuning (Only for Synchronous Machine)

For machines without attached steel rope and no load, please follow section 6.2.1 "Motor Initial Angle Tuning with no load". For machines attached with steel rope and have load, please follow section 6.2.2 "Motor Initial Angle Tuning with load".

(The two angle tuning modes can achieve the same effort. Please choose one of them according to the actual situation.)

6.2.1 Motor Initial Angle Tuning with no load

Please set PG type F8-02 correctly, set AutoTuneModeSel FC-13 to 0 before perform Motor initial tuning with no load (Do not attach steel ropes). Procedures required before tuning:

- 1) Ensure synchronous motor (traction machine) has no load (DO NOT attach steel ropes);
- 2) Connect running contactor output Y9 (J5-10) and COM3 (J5-6) to make it close;
- 3) Connect brake contactor output Y7(J5-8) and COM3 (J5-6) to release the brake;

Perform motor initial angle tuning with hand operator based on following procedures shown below:

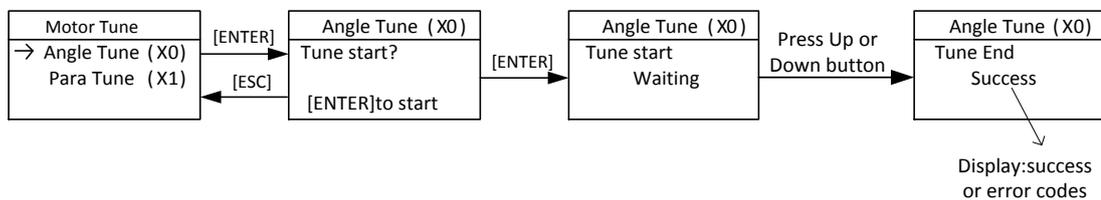


FIGURE 6.3 Motor initial tuning with no load (Do not attach steel ropes) sketch

Note: Rotation angle tuning no longer distinguish encoder type.

After pressing “Enter”, tuning starts. First, motor rotates to a firm position, then it rotates forward (facing to driving shaft, anticlockwise rotation is forward direction) in a constant speed, rotation speed and time depends on the pole number and initial position, it stops after maximum one round rotation, then it rotates to one position and remains for 2 s again, motor stops and indicates success. The whole tuning procedure lasts less than 20s.

Chart 6.2 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 VI Driver Fault List .
RF226	Give voltage limit Already give limit force during angle tuning, but feedback current cannot reach least requirement.	<ol style="list-style-type: none"> 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). 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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). 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Motor carrying partial load; 2. Bad feedback speed of encoder. 	<ol style="list-style-type: none"> 1. Ensure brake is off; 2. Remove interference of encoder.
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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. Detect power matching of motor and driver controller, reduce the rated current [F5-08], and resume F5-08 after tuning.

Chart 6.2 Motor Initial Angle Rotation Tuning Fault List (Cont'd)

Error Code	Definition	Possible Causes	Possible Solution
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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.

Note:

1. Above description is for SIN/COS encoder;
2. For increment encoder, RF231 correspond to UVW signals, RF234 correspond to Z pulse. The solution is same, and other faults are same too.

6.2.2 Motor Initial Angle Tuning with load

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)Set running parameter(F1), motor parameter(F5), encoder parameter(F8) correctly;
- 3)All mechanical faults in hoistway are eliminated !

1) Motor Initial Angle Tuning with Hand Operator

Correctly set PG type F8-02 on digital operator, set tuning method parameter (FC-13) to “1” (default setting is 1 in BL Series Integrated Controller), perform motor initial angle tuning based on following procedures shown below:

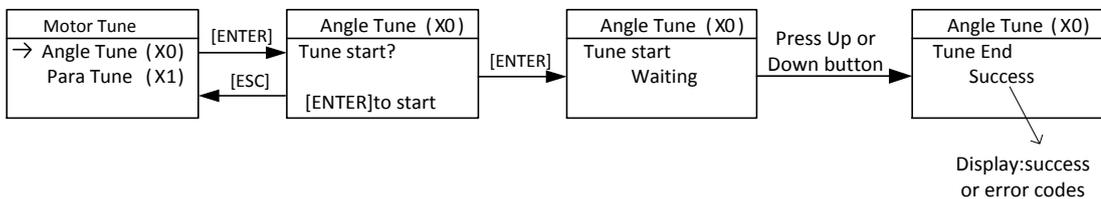


FIGURE 6.4 Motor initial tuning with load (attach steel ropes) sketch

After pressing “Enter”, tuning starts. When digital operator indicates “running” , press jog up or down button , contactor KDY 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.(Motor keep still in this procedure.);(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.

2) Motor Initial Angle Tuning With digital tubes and operation keys on the upper left of main board

Contents of appendix VII.

- 3) Please note the following items at Motor initial Angle tuning with load (attach steel ropes):
- 1) **To ensure safety, during tuning process, people are not allowed to stay in car/hoistway!**
 - 2) 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 test run, make sure there is no gap between two steps. If no fault happens, before digital operator indicates success, press the jog up or down button constantly; **(Except fault or error exists!)** ;
 - 4) If car running direction is opposite to inspection run button, correct this through F6-03.0: traction sheaves counterclockwise rotation & car run down; 1: traction sheaves clockwise rotation & car run up (facing to traction sheaves). Set according to actual situation.

Chart 6.3 Motor initial Angle tuning with load (attach steel ropes) error code

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 VI Driver Fault List .
RF226	Give voltage limit Already give limit force during angle tuning, but feedback current cannot reach least requirement.	<ol style="list-style-type: none"> 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). 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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). 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Release Up or Down button while tuning; 2. Fault occurs during angle tuning. 	<ol style="list-style-type: none"> 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 V 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	<ol style="list-style-type: none"> 1. Brake open or brake force is not enough; 2. There's interference in encoder. 	<ol style="list-style-type: none"> 1. Ensure brake is off; 2. Remove interference of encoder.

Chart 6.3 Motor initial Angle tuning with load (attach steel ropes) error code (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.	<ol style="list-style-type: none"> 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) 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Brake open or brake force is not enough; 2. Bad encoder wire or interference in encoder. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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) 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Interference in R pulse signal; 2. A & B signals connection error; 3. Inspection elevator speed setting is too low. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.

6.3 Asynchronous Motor Adjustment

Asynchronous motor does not need angle tuning. But compared with synchronous motor, NO-Load Current (F5-9) and Rated Slip (F5-10) should be adjusted. The parameters and information's below should be confirmed as well (parameters below are different with synchronous motor).

Chart 6.4 Motor Parameters Confirmation

Para No.	Display	Content	Range	Parameter setting requirements
F5-00	Motor Type	Set motor type 0: sync- outer rotor, 1: async machine, 2: sync-inner rotor	0~2	1
F5-01	Poles	Motor poles (Nameplate)	1~99	Fill in according to actual motor parameters
F5-02	Sync Freq	Motor synchronous frequency (Nameplate)	0.001~50	Fill in according to actual motor parameters
F5-03	Rated Power	Motor rated power (Nameplate)	1~50	Fill in according to actual motor parameters
F5-04	Rated Speed	Motor rated speed (Nameplate)	1~1999	Fill in according to actual motor parameters
F5-08	Rated FLA	Motor rated current. (Nameplate)	0~99.999	Fill in according to actual motor parameters
F5-09	NO-Load Current	For asynchronous machine, no-load excitation current.	0.1~50	Fill in according to 30% rated current, adjustable in 20% to 40%; If rated current is set too small, motor will run with howling sound; If set too large, fluctuation feeling will be obvious in steady speed period.
F5-10	Rated Slip	For asynchronous machine rated slip. (Nameplate)	0.1~10	Rated Slip=rated freq-(Rated Speed× pole pairs/60) If rated Slip is set too small, motor speed could not keep pace during acceleration--OE fault. If set too large, motor could not keep pace with acceleration Ref in steady period or indicate overcurrent fault.

Chart 6.5 Encoder Parameters Confirmation

Para No.	Display	Content	Range	Parameter setting range
F8-00	Encoder PPR	The encoder pulse count per-revolution.	100~8192	Typically, Encoder PPR is 1024. Specific modification according to actual situation.
F8-02	PG Type	PG card type 0: Incremental encoder, 1: Sine/Cosine encoder	0/1	PG type is 0: Incremental encoder. Short JA, JB short blocks on PG card if choose to use 12V encoder.

Chart 6.6 PI Parameters Confirmation

Para No.	Display	Content	Range	Parameter setting requirements
F6-04	Kp	Speed loop proportional gain. (Valid for complete curve if not used in multiple PI.)	0~65535	Default value is 1000.No need to modify typically. It can be adjusted in increments of 100 when debugging.
F6-05	KI	Speed loop integral gain. (Valid for the complete curve if not used in multiple PI.)	0~65535	Default value is 600.No need to modify typically. It can be adjusted in increments of 100 when debugging.
FA-04	Zero Keep Kp	Proportional gain of zero speed keeping	0~2000	Default value is 180. It is the zero-speed given status while starting. If sliding or shaking, you may adjust this parameter.
FA-05	Zero Keep KI	Integral gain of zero speed keeping.	0~10000	Default value is 550. It is the zero-speed given status while starting. If sliding or shaking, you may adjust this parameter.

Chart 6.7 Time Setup Parameters

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang	Ref Page
F2-00	Brake ON Time	After system output open brake (Y7), brake contactor and brake arm feedback (if set F1-31 to 1), wait brake ON time (F2-00), then give running speed. Brake ON Time (F2-00) has two functions: 1. Brake open fully in this waiting time to avoid running speed exists when brake open. 2. Tractor may turn under the action of load after open brake. Let tractor sheave stable at zero speed and then start speed to get a better start comfort. According to brake situation, Brake ON Time should be set to 0.8~1.5s /0.3~0.5 in sync control/async control.	0.00 ~ 9.99	0.5	s	Y	6-4

Chart 6.7 Time Setup Parameters (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang	Ref Page
F2-01	Brake OFF Time	When start closing brake, brake cannot hold traction sheave immediately due to freewheeling and demagnetization. Keep output torque in this period of time. Remove internal direction enable and cancel torque output after this time. This parameter can prevent car slip caused by brake lag when car stopping. According to brake situation, Brake OFF Time should be set to 0.8~1.5s /0.3~0.5 in sync control/async control.	0.00 ~ 9.99	0.5	s	Y	6-4
F2-02	Insp Brake Time	Brake is not close at zero speed when stops at inspection running. Brake close immediately with running speed exists after canceling jog up/down input. Keeping torque output time is too long in an asynchronous traction machine control situation will cause drive output overcurrent protection. Appropriately reduce this parameter value can avoid it. Insp Brake Time should be set to 0.8~1.5s /0.1~0.3 in sync control/async control.	0.00 ~ 9.99	0.05	s	Y	6-4

Chart 6.8 Zero Speed Parameters

Para No.	Display	Content	Range	Parameter setting requirements
F1-16	Zero Speed	Motor speed less than set value, system considers elevator speed as zero and output brake signal.	0~10	Set to 1 circle / 5circles for sync /async machine.

Warning: Most of asynchronous motors use incremental encoder which works at 12V voltage.

6.4 Inspection Running

1. Things to check before inspection running:

- 1) Safety circuit/door interlock circuit are normal, **DO NOT short door interlock!**
- 2) After power on, **KJT** emergency stop contactor in control cabinet, **KMB** door interlock contactor, **KMC power** contactor are closed, check if the controller is normal and parameter setting is correct, in LCD indicator, elevator state is "INSP".
- 3) **Connect the brake to control cabinet properly.**

2. Inspection running

When the conditions for inspection running in machine room are satisfied, press the Jog Up/Down button on the control cabinet, elevator will run up/down in set inspection speed. If car running direction is opposite to inspection run button, correct this through F6-03. 0: traction sheaves counterclockwise rotation & car run down;1: traction sheaves clockwise rotation & car run up. Set according to actual situation.

6.5 Hoistway Parameter Learning

Chart 6.9 Parameters need to set before hoistway parameter learning

Para No.	Name	Setup Method
F0-00	Total Floor	Set floor number based on actual site condition.

6.5.1 Perform Hoistway Parameter Learning with Hand Operator

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 7.4.

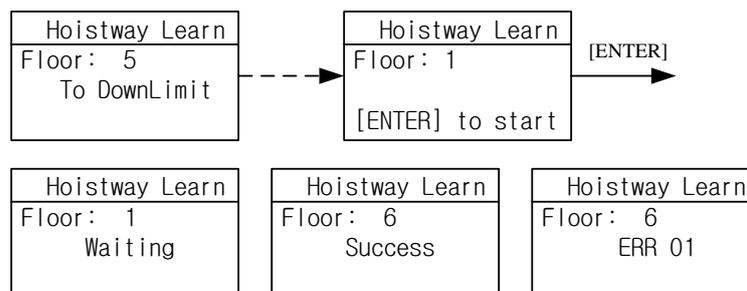


Figure 6.5 Hoistway Parameter Self-Learning Procedures

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 table in chapter 8, find out the reason and solve it accordingly, then start hoistway parameter self-learning again.

Note: When self-learning process stops, only when LCD indicator shows “success” on digital operator, self-learning is completed successfully.

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. 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 / close instruction to control the door.
3. Make sure elevator can start, accelerate, decelerate, leveling normally in normal speed.

If running is abnormal, please check for parameters setting.

6.5.2 Perform Hoistway Parameter Learning with Digital Tubes & Operation Keys

Contents of Appendix VII.

6.5.3 Hoistway Parameter Learning Fault Diagnosis

Chart 6.10 Hoistway Parameter Learning Fault Diagnosis

Error Code	Definition	Possible Solution
LER=0	System running error	Press "ESC" to exit learning, check fault record shown in table 8.1
LER=1	Pulse input phase reverse	Exchange phase A and phase B in encoder.
LER=2	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.
LER=3	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.
LER=4	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.
LER=5	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.

Chart 6.10 Hoistway Parameter Learning Fault Diagnosis (Cont'd)

Error Code	Definition	Possible Solution
LER=6	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.
LER=8	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.
LER=9	Bottom terminal 1 switch signal lost	Top terminal 1 switch enable before bottom terminal 1 switch or bottom terminal 1 switch signal lost.
LER=10	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.
LER=11	Top terminal 1 switch signal lost	Top limit switch enables before top terminal 1 switch or top terminal 1 switch signal lost.
LER=12	Total floor setting error	Check total floor number match actual floor number. Check leveling inductor plates on every floor.
LER=14	Two leveling inductors cannot trigger together	Leveling inductor plate on this floor cannot cover both inductors or missing one leveling inductor.
LER=15	Press "ESC" in the middle of hoistway parameter learning process.	Cancel the learning by pressing "ESC".
LER=17	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.
LER=18	Hoistway data saving error	▲ Please contact supplier at once.
LER=19	Both leveling switch signal enable together when arrive at top limit switch.	Move up top limit switch.
LER=20	Bottom limit switch too high	Lower the bottom limit switch.
LER=21	When elevator reaches top limit switch, bottom terminal 1/2 switch is valid.	Check the switches position and their wirings.
LER=22	When elevator start from bottom limit switch, top terminal 1/2 switch is valid.	Check the switches position and their wirings.
LER=23	No pulse feedback after starting.	Check the wire of PG card.
LER=25	The up and down door zone signals are opposite in hoistway learning.	Check installation positions of up and down door zone sensors, exchange their wires.

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

6.6 Start-up comfort level adjustment

6.6.1 Comfort level adjustment with weighing device

There are 3 weighing devices available for BL series integrated controller: 1. Blue-light CAN BUS weighing device; 2. -10V to 10V simulated signal output weighing device; 3. 0-10V simulated signal output weighing device.

Parameter F9-13 can be used to choose the weighing device.

Before adjust elevator start-up comfort level with weighing device, **make sure the weighing device is tuned and it can respond the correct cabin load situation.**

Adjustment method:

- 1) With cabin no load, adjust F9-00 till car does not slip at empty load condition: When car has no load and brake open, if counter-weight goes down, then increase F9-00. Otherwise if car goes down then decrease F9-00. Normally F9-00 is set between 45% to 70%.

- 2) Adjust F9-19 & F9-20: When elevator balance coordinator is 45%, if F6-03=0, then set F9-19 & F9-20 to $-(50-45) = -5$. If F6-03=1, then set F9-19 & F9-20 to $(50-45) = 5$.
- 3) After empty load adjustment, if full load condition is different, then adjust F9-21: When car has full load and brake open, if counter-weight goes down, then decrease F9-21. Otherwise if car goes down then increase F9-21.

The block diagram of weighing is shown below:

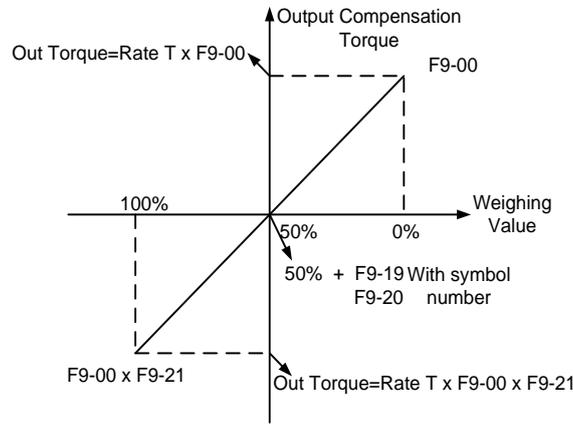


Figure 6.6 Good comfort level could be achieved with adjustment shown above

6.6.2 Start without Load Compensation Setup

When using BL6 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:

- a) PG card type, F8-02 is set to "1" (Sine/Cosine PG card)
- b) Weighing compensation invalid, confirms F9-11 is set to "0" to disable weighing compensation and enable FA group parameters.

2) Adjustment method for elevator starting without load compensation:

- a) Principles: As can be seen in figure 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.

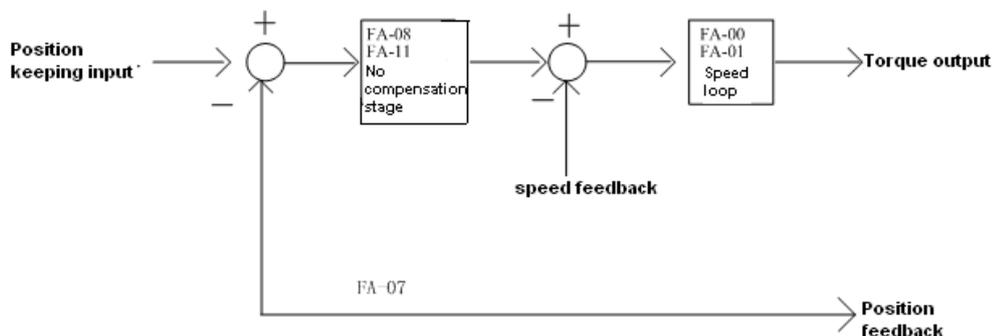


Figure 6.7 Flowchart for elevator starting without load compensation

b) Parameters: Parameters related to function can be seen below in table below.

Chart 6.11 Elevator start without load compensation parameters list

Parameters No.	Display	Factory Setting	Fast Brake Recommendation	Slow Brake Recommendation
FA-00	StratKP	30	KEEP	KEEP
FA -01	StratKI	750	KEEP	KEEP
FA -08	PLKP1	2500	4800	3600
FA -09	PLTime	900	700	KEEP
FA -11	PLKP2	800	KEEP	KEEP
FA -12	PLKPMOD	125	KEEP	KEEP
F2-00	Brake ON Time	0.5	0.9	1
F9-00	Max Torq Comp	0	KEEP	KEEP
F9-11	Load Comp Enable	1	0	0

c) 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 与 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.

(The period of torque keeping means keep zero speed period before speed curve start, after release brake.)

Note:

- 1) During commissioning, besides the mentioned 3 parameters, other FA group parameters can be kept with factory setting.
- 2) 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.
- 3) 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).

6.6.3 Elevator normal speed comfort level adjustment

Adjustment for Start/Brake Speed curve.

Elevator running speed curve is shown below.

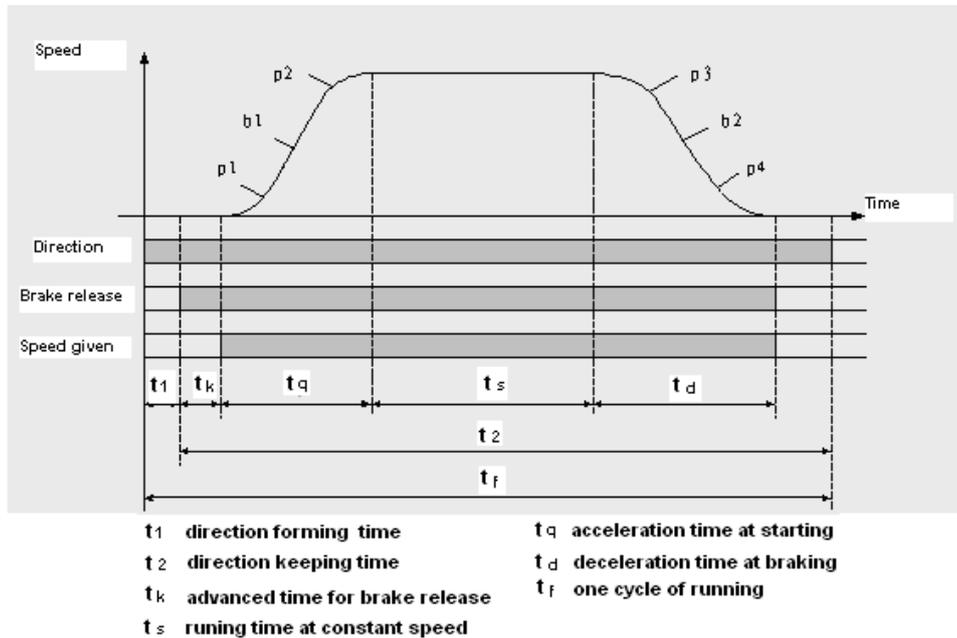


Figure 6.8 Elevator running speed curve graphic

Note: In the guarantee of elevator operation efficiency, adjust the 6 parameters of curve slope appropriately to obtain best elevator operation curve when debugging in the actual situation.

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

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

Chart 6.12 Speed Loop PI Recommend Value

Type	Recommend Value
Proportional	1000
Integral	600

Speed loop proportional/integral can be adjusted in 50 increments. If system performance is not perfect at start or stop period (low speed period), try to control in multi-section PI. Detailed method in description section of specific section in instruction.

6.7 Leveling Precision Adjustment

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

6.7.1 Basic Conditions for Elevator Leveling

- 6.7.1.1 Make sure the leveling switches and leveling inductor plates are installed in the right position.
- 6.7.1.2 Leveling inductor plates length on every floor must be same.
- 6.7.1.3 Leveling inductor plates must be installed vertically.
- 6.7.1.4 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), otherwise elevator leveling will have deflection, which means in up or down running, elevator stops higher or lower than leveling position.
- 6.7.1.5 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.
- 6.7.1.6 To ensure precise leveling, system require elevator to crawl for a certain distance before stop.
- 6.7.1.7 In practice, first make adjustment for a middle floor, until leveling is precise. Then, adjust the other floors on the base of these parameters.

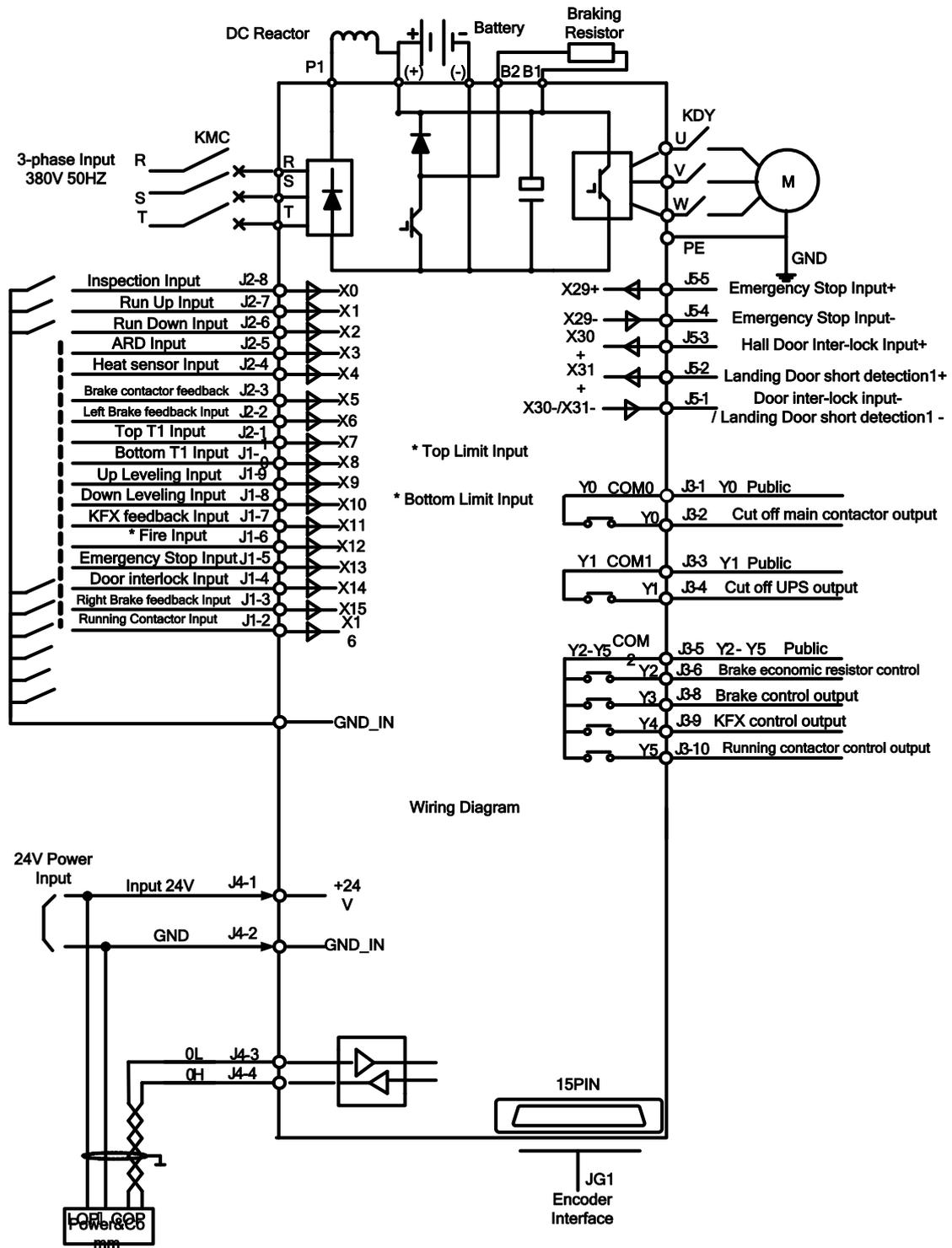
After adjusting curve selection, ratio and integral gain in the above context, please make sure every time elevator runs up or down, when stop at middle floor, its leveling positions are the same (or deflection $\leq \pm 2 \sim 3$ mm every time).

6.7.2 Leveling Parameter Adjustment

If elevator still cannot achieve desired leveling condition with adjustment based on instructions in chapter 7.1, 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).

Warning: If the leveling precision of a majority of floors are no good, you should firstly adjust leveling parameter to make most of them leveled, and then adjust the flag of specific ones.

7 Integrated Controller Terminal Wiring Diagram



Note: For all terminals with "*", except X5, are not needed in the "simple wiring solution". Detail can be seen in Appendix I.

Appendix I BL6-U Series Integrated Controller Simple Wiring Solution

For integrated Controller of home lift MU-V6 main board logic program support the function of "Simple wiring solution". The detailed description of the function and setting method are as follows:

The up-limit signal is generated with up terminal/down door zone signal valid + up door zone signals invalid; the down limit signal is generated with down terminal/up door zone signal valid + down door zone signals invalid.

Note: When using this function, please short connect X5 (J3-3) & GND_IN (J6-2) as inspection signal for outer circuit power cut, this is to prevent controller miss-register floor information at outer circuit power cut.

BL2000-CZB-V10 COP can support CAN BUS control COP open/close door. In this way the open/close door signal in the hoistway cable (total 5 wires) can be reduced.

Door open relay 1,2 & door close relay use the same public terminal (J11-6), J11-5 is door close relay output, J11-9 is door open 1 relay output, J11-10 is door open 2 relay output. Y2-Y5 relay on main board still output the door open/close signal and can be used to monitor the door condition when command go through CAN BUS.

Integrated controller and LOP CAN communication can add electric lock and fire signal. Together with BL2000-HAH-M1.1, FR2000-HAH-V9 & BL2000-HAH-B9 it could allow CAN BUS to control electric lock and fire mode and save 2 cables in the hoistway.

To enable this function, short DS jumper on LOP.

Note: Only 1 LOP for one elevator can short jumper DS and set as electric lock/fire service input. If parking floor and fire floor are different, please connect a wire from this LOP to the other floor.

BY0-3 24V Public	BY0-4	Spare Input 0
BY1-3 24V Public	BY1-4	Spare Input 1

Default: Spare input 0 as electric lock input, spare input 1 as fire service mode input.

Parameters need to set on Integrated controller:

F4-07-03 set "On" to enable CAN BUS electric lock function.

F4-07-04 set "On" to reverse CAN BUS electric lock enable type.

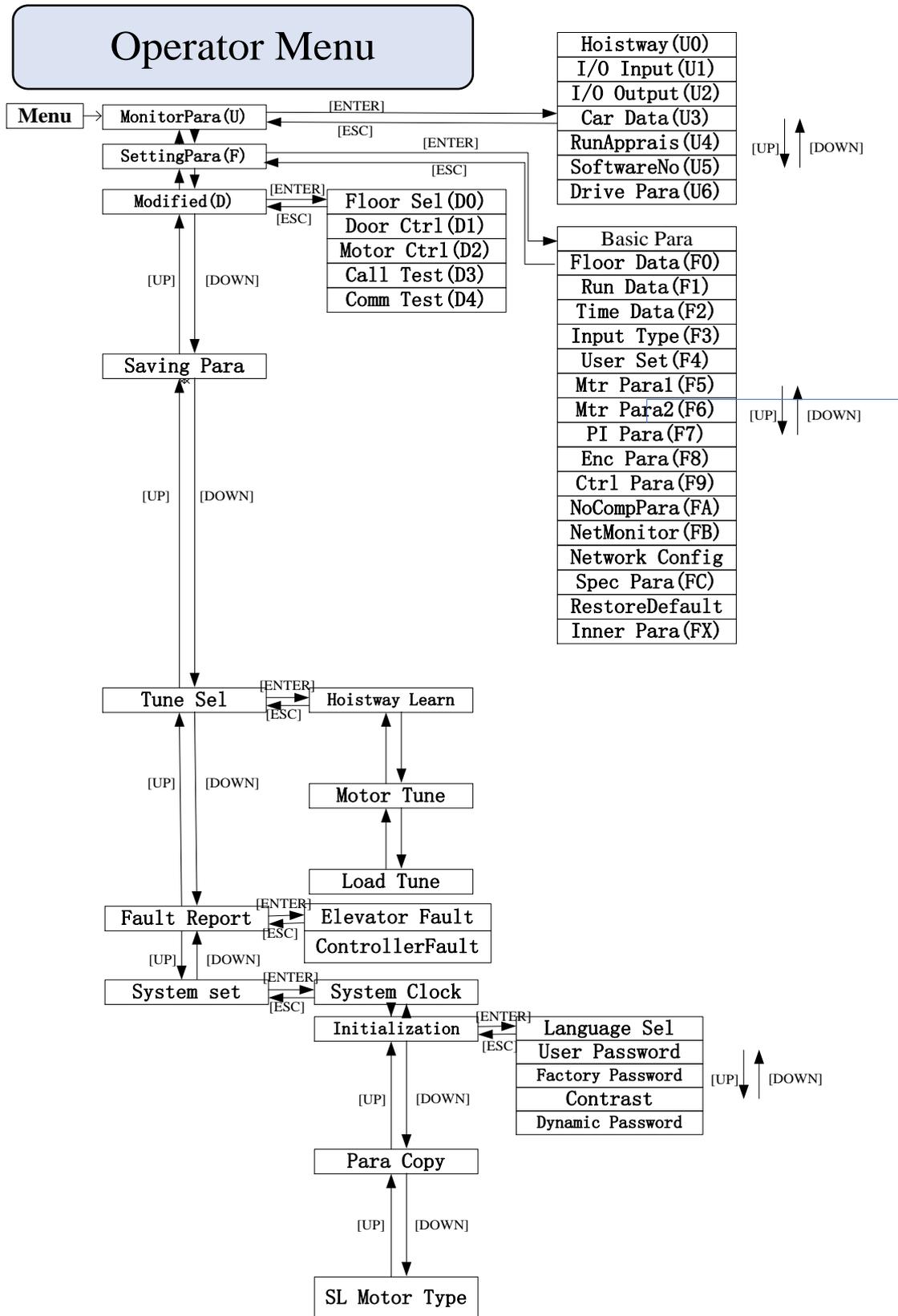
F4-07-05 set "On" to enable CAN BUS fire service function.

F4-07-06 set "On" to reverse CAN BUS fire service enable type.

Note: After CAN BUS fire signal is enabled, its original terminal on the main board (X12) is still valid, both signals could enable elevator fire-service mode.

Note: When controller enables CAN BUS electric lock/fire service function but without LOP or LOP did not connect jumper DS or communication break, elevator cannot enter lock/fire-service mode.

Appendix II BL6-U Series Integrated Controller Operator Menu

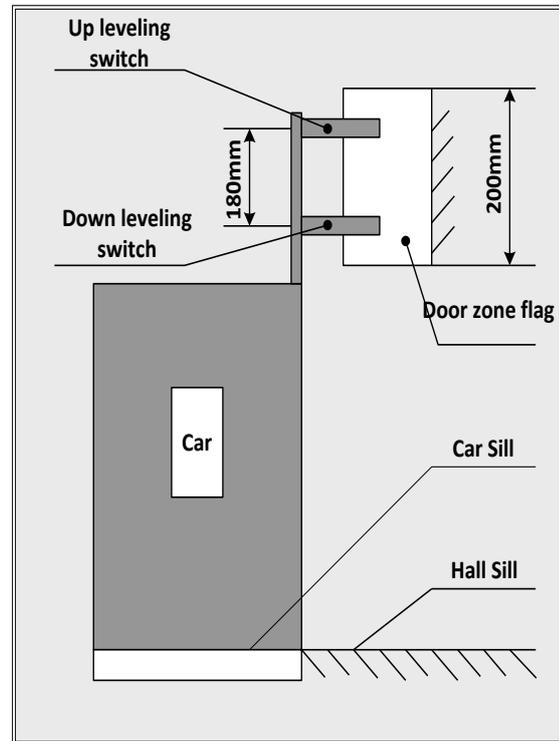


Appendix III Leveling Switches & Flag Installation

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



Door zone flag & Leveling Switch Position

Appendix IV Parameters

U0 Monitoring Parameters

Para No.	Display	Content	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 1 in hoistway. Data will be recorded after finishing hoistway learning	m	--
U0-03	Lower Slowdown 2	Location of bottom terminal switch 2 in hoistway. Data will be recorded after finishing hoistway learning	m	--
U0-04	Upper Slowdown 1	Location of top terminal switch 1 in hoistway. Data will be recorded after finishing hoistway learning	m	--
U0-05	Upper Slowdown 2	Location of top terminal switch 2 in hoistway. Data will be recorded after finishing hoistway learning	m	--
U0-06...69	Floor Data 1...64	The location of floor 1-64 switches in hoistway. Data will be recorded after finishing hoistway learning	m	--

U1~U5 Monitoring Parameters

Para No.	Display	Content	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.	--	--
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.	--	--
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.	--	--
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	--
U4-04	SendApp1	Signal send appraisal for Duplex and group control. Large number means com send more mistakes.	--	--
U4-05	ReceiveApp2	Signal receive appraisal for Duplex and group control. Large number means communication receive more mistakes.	--	--
U4-06	Interfere Appraise	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 Appraise	The interference degree of encoder signal. When elevator runs steady, large value states the encoder signal weak with heavy interference.	--	--
U4-09	Lock Timer	The current elevator stop timer	--	--
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.	--	--

U1~U5 Monitoring Parameters(Cont'd)

Para No.	Display	Content	Unit	Ref Page
U5-02	CpldEdition	Show base drive control software information. Provide the current software version for factory maintenance and software upgrading.	--	--

U3-00 Cabin Signal Content & Definition

Cabin signal	Symbol signal	Cabin terminal No.	Content
C00	IGM1	J3-4	door close 1 input
C01	IKM1	J2-4	door open 1 input
C02	IGM2	J5-4	door close 2 input
C03	IKM2	J4-4	door open 2 input
C04	GMV2	J10-6	door close limit 2 input
C05	KMV2	J10-5	door open limit 2 input
C06	GMV1	J9-3	door close limit 1 input
C07	KMV1	J9-2	door open limit 1 input
C08	SZY	J10-1	Special Use Input
C09	IGMYS	J6-4	door open delay input
C10	SZH	J9-10	Attendant input
C11	--	--	Empty (for Backup use)
C12	SZS	J10-2	Bypass drive input
C13	MZ	J9-6	Full-load input
C14	QZ	J9-8	Light-load input
C15	CZ	J9-5	Over-load input
C16	KZ (50%)	J9-9	50% Full-load (No-load) input
C17	KAB2	J9-7	Door safety plate 2
C18	KAB1	J9-4	Door safety plate 1

U6 Drive Monitoring Parameters List

Para No.	Display	Content	Unit
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

Building Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
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
F0-02	Fire Floor	At fire-linkage circuit close, elevator enter fire mode and return to this floor automatically.	1~ Total Floor	1	--	N
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
F0-04	VIP Floor	VIP floor setup	1~ Total Floor	1	--	N
F0-05 ...68	Set Indication 1~64	Set indication 1-64, customized character/figure display available	---	1...64	--	N

Running Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
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
F1-01	Motor Speed	Motor speed at elevator rated speed (Calculated)	1~9999	96	RPM	N
F1-03	Insp Speed	Car running speed at inspection cannot exceed 0.6m/s based on relevant standards and regulations	0~0.6	0.3	m/s	Y
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	0.00	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	0.3	m/s	Y
F1-06	Least Speed	Steady speed on the lowest speed curve.	0~1.0	0.5	m/s	N
F1-07	Open Door Speed	Car speed when elevator open door in advance is allowed.	0~0.3	0.15	m/s	N
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
F1-09	Relevelrun Speed	Elevator running speed at re-leveling.	0~0.10	0.05	m/s	N
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	0.25	m/s ²	N
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	0.25	m/s ²	N
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	0.25	m/s ³	N
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
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
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
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
F1-17	Leveling Adj	Adjust differences of up/down leveling	0~100	50	mm	N
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
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; when setting "5" temporary shielding limit fault, run to up/bottom limit switch in inspection mode.	0~9	0	--	N

Running Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
F1-22	Two Door Mode	Setup rear door mode, based on customer requirements, set from mode "0" to "5".	0~5	0	--	N
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	0	--	N
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
F1-25	Twins Control	Elevator duplex control: 1: On 0: OFF	0/1	0	--	Y
F1-26	Group Control	Elevator group control: 1: ON 0: OFF	0/1	0	--	Y
F1-27	Far Monitor	Remote Monitoring System: 1: On 0: Off	0/1	0	--	Y
F1-28	Auto Parking	Auto parking: 1: ON 0: OFF	0/1	0	--	Y
F1-29	Load Enable	Load Weighing: 1: ON 0: OFF	0/1	0	--	Y
F1-30	Open Delay Able	Door open/close delay: 1: ON 0: OFF	0/1	0	--	Y
F1-31	Brake Feedback	Test brake feedback signal: 1: open 2: close	0/1	1	--	Y
F1-32	Rerun Password	Password to release elevator stop.	0~9999	0	--	N

Time Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
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	0.50	s	Y
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	0.50	s	Y
F2-02	Insp Brake Time	The time delay in inspection mode before brake close.	0.00~9.99	1	s	Y
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
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
F2-06	Open Delay Time	Enable door open delay function, press open delay button, door open time will be delayed.	0~999	30	s	Y
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

Time Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
F2-08	Door Run Time	1. The 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	5	s	Y
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	s	Y
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	0	s	Y
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
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
F2-18 F2-19	Start Time1	System will automatically start the elevator (Electric lock: ON) at set time.	00:00 ... 23:59	00:00	Hour: minute	Y
F2-20 F2-21	Stop Time1	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

Note: 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.

Input Type Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Change
F3-00	Input Type	Setting the input type on main control panel. Each bit corresponds to one terminal. Set default level of main board input port. ON: Close enable, OFF: Open enable.	0~4294967295	4294962815	N
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
F3-02	Input select 1	X6 Input Function Selection.	0~32	6	N
F3-03	Input select 2	X15 Input Function Selection.	0~32	15	N
F3-07	output select 1	Y0 Output Function Selection.	0~32	0	N
F3-08	output select 2	No use for home lift.	0~32	11	N
F3-09	output select 3	No use for home lift.	0~32	12	N

Note: When using X22 and X23 as multifunctional input port, please make sure the re-leveling device is NOT used.

Service Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Change
F4-00	Set Stop Floor1	Set elevator stop/bypass at floor corresponds to each bit. (1-32 floors)	0~ 4294967295	4294967295	Y
F4-01	Set Stop Floor2	Set elevator stop/bypass at floor corresponds to each bit. (33-64floors)	0~ 4294967295	4294967295	Y
F4-02	TIM Stop Floor1	Set elevator stop/bypass at floor corresponds to each bit at the set time. (1-32 floors)	0~ 4294967295	0	Y
F4-03	TIM Stop Floor2	Set elevator stop/bypass at floor corresponds to each bit at the set time. (33-64 floor)	0~ 4294967295	0	Y
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 levels)	Y
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	4294967295(1~32 levels)	Y
F4-06	Function Select	Set elevator functions enable /disable at floor corresponds to each bit. (ON: Enable, OFF: Disable)	0~ 4294967295	4	Y
F4-07	Function Select 2	Set elevator functions enable /disable at floor corresponds to each bit. (ON: Enable, OFF: Disable)	0~ 4294967295	0	Y

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: Manual door control; OFF: Automatic door control;(Software version 10007206 and above has this function).
F4-06-02	While ER14 occurs, levels the car first to evacuate passengers on the nearest floor in the first place then return to the base floor.
F4-06-03	ON: Disable ER29 fault; OFF: If communication interference is severe then report ER29 fault.
F4-06-04	ON: Two elevators in duplex control and not in service, when the same floor has both up/down landing call registered, both elevators serve this call. OFF: Only one elevator serves this call.
F4-06-05	ON: Elevator disable cabin overload signal, this is used in elevator 125% load test. 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	Only for internal test. Remain the default OFF state.
F4-06-11	ON: Cancel emergency stop contactor in the Control cabinet.
F4-06-12	ON: Define X30 as the hall-door safe circuit and X31 as the car-door safe circuit.
F4-06-13	ON: Cancel door lock contactor in the Control cabinet. Remove contactor feedback detection, replace with door lock circuit high voltage detection.
F4-06-14	ON: Enable elevator function for disabled people. OFF: Disable elevator function for disabled people.

SPECIAL FUNCTION LIST (CONT'D)

Number	Instruction
F4-06-15	ON: In Fire mode when elevator leaves fire floor then disables fire linkage output, when elevator return to fire floor then restore fire linkage output.
F4-06-16	ON: When door lock is closed, door close limit must be valid too. OFF: Door lock state is not related to door close limit.
F4-06-17	ON: When elevator stops in inspection mode, inverter-direction-given and brake are released together. OFF: When elevator stops in inspection mode, inverter-direction-given drop is 0.5s later than brake close.
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: Manual door control; OFF: Automatic door control;(Software version 10007205 has this function).
F4-06-20	ON: When Manual door control, elevator cannot run without open/close door for at least one time; OFF: When Manual door control, if the door does not open, elevator can run after 20s;(Only Software version 10007205 has this function).
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: 3-phase 380V 50Hz power supply (with back-up generator) OFF: Battery power supply (disable DC-BUS under voltage fault)
F4-06-23	ON: Use SJT-300 weighing device through CAN BUS OFF: Use SJT-150 weighing device through RS485
F4-06-24	Reserved.
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: Passengers can input more than three car calls in light-load mode. OFF: Passengers cannot input more than three car calls in light-load mode. (For versions after 10007206)
F4-06-27	ON: In manually operated door control mode, car cannot run without an opening door operation. OFF: In manually operated door control mode, car can continue running when door remains closed for 4 times longer than Door Run Time. (For versions after 10007206)
F4-06-28	ON: Use light curtains/safety plates separately, the attendant up/down input terminal is used as front/rear door safety plates input. In fire mode or if light curtains are effective for 2 minutes continuously, disable light curtains input.
F4-06-29	ON: Motor operation & internal SC contactor are used separately, X11 as Internal SC contactor feedback terminal, Y4 as Internal SC contactor output control; (See wiring diagram for detail) OFF: Operation contactor has internal short-circuit function.
F4-06-30	ON: Integrated controller LED has reverse display. This is used for Blue-light G-series cabinet in room-less elevator (where control board is placed reversely) OFF: Integrated controller LED has normal display. (U menu is reversed; F menu is normal)
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	Reserved.
F4-07-03	ON: Enable serial connected electric lock.
F4-07-04	ON: Take negative for serial connected electric lock.

SPECIAL FUNCTION LIST (CONT'D)

Number	Instruction
F4-07-05	ON: Enable serial connected fire-linkage signal.
F4-07-06	ON: Take negative for serial connected fire-linkage signal.
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	Attention: When using this function, this brake feedback X15 must be disabled. ON: Main board X15 input is used as over load signal input. OFF: X15 is used as standby input.
F4-07-10	Attention: When using this function, this brake feedback X6 must be disabled. ON: Main board X6 input is used as slight load signal input. OFF: X6 is used as standby input.
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.
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	OFF: Improve car stop. (Default) ON: Give up the time-dependent decreasing speed curve after speed change in leveling zone.
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. (For versions after 10007206)
F4-07-17	ON: In UPS running mode, elevator will arrive into leveling zone, open the door, close the Y1 relay in 30 seconds, and cut off the UPS circuit to avoid a deep discharge of the UPS battery pack.
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 set 2 corresponds Set Stop Floor parameter is: F4-02 Set Stop Floor1, F4-03 Set Stop Floor 2.
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: 00 am. (Software version 10007206 and above has this function).
F4-07-23	ON: If floor fault occurs neither at top floor while up running nor at bottom floor while down running, the elevator will decelerate and stop, then report error. (Software version 10007206 and above has this function).
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.

SPECIAL FUNCTION LIST (CONT'D)

Number	Instruction
F4-07-27	ON: Brake force self-test function. Every day at 2:00 am, the elevator will do brake force self-test in auto mode or can-do brake force self-test by adjusting F4-07-30. (Software version 10007206 and above has this function).
F4-07-28	Reserved.
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.
F4-07-30	Each time changed from OFF to ON, it will trigger brake force self-test once. Keeping ON will be ineffective. (Software version 10007206 and above has this function).

Motor Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang
F5-00	Motor Type	Set motor type (0: sync- outer rotor, 1: async machine, 2: sync-inner rotor)	0~2	0	--	N
F5-01	Poles	Moto poles (Nameplate)	1~99	20	--	N
F5-02	Sync Freq	Motor synchronous frequency (Nameplate)	0.001~99.999	16	Hz	N
F5-03	Rated Power	Motor rated power (Nameplate)	1~50	5.1	kW	N
F5-04	Rated Speed	Motor rated speed (Nameplate)	1~1999	96	RPM	N
F5-05	V IN	Motor counter-EMF (Nameplate)	1~380	280	V	N
F5-06	L_phase	Motor phase inductance set. (Auto-tuning/ manual input)	Auto-tuning/ Nameplate		mH	N
F5-07	R_phase	Motor phase resistance set. (Auto-tuning/ manual input)	Auto-tuning/ Nameplate		Ω	N
F5-08	Rated FLA	Motor rated current. (Nameplate)	0~99.999	12	A	N
F5-09	NO-Load Current	For asynchronous machine, no-load excitation current.	0.1~50	0	A	N
F5-10	Rated Slip	For asynchronous machine rated slip. (Nameplate)	0.1~10	1.5	HZ	N
F6-00	Carrier Freq	Set controller carrier frequency.	6~15	8	kHz	N
F6-02	SpeedZoom	Speed Zoom (Reduce elevator actual running speed)	0~100	100	%	Y
F6-03	DirSel	Select motor running direction (0/1: Motor rotates anti- clockwise, car move down/up).	0/1	0	--	--
F6-04	Kp	Speed loop proportional gain. (Valid for complete curve if not used in multiple PI.)	0~65535	1000	--	--
F6-05	KI	Speed loop integral gain. (Valid for the complete curve if not used in multiple PI.)	0~65535	600	--	--

Multiple PI Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang
F7-00	PIMulEnable	Multiple PI parameters 1: Enable; 0: Disable	0/1	0	--	N
F7-01	PI1 Range	PI available range 1 (Start -middle speed running PI switch frequency)	0~Rated freq	5.0	Hz	Y
F7-02	PI2 Range	PI available range 2 (middle -high speed running PI switch frequency)	0~Rated freq	0	Hz	Y
F7-04	PI3 Range	PI available range 4	0~Rated freq	0.5	Hz	Y
F7-05	Kp1	PI available range 1 proportional gain	0~2000	1200	--	Y

MULTIPLE PI SETUP PARAMETERS LIST(CONT'D)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang
F7-06	Kx1	PI available range 1 integral gain	0~2000	900	--	Y
F7-07	Kp2	PI available range 2 proportional gain	0~2000	1000	--	Y
F7-08	Kx2	PI available range 2 integral gain	0~2000	600	--	Y
F7-11	Kp3	PI available range 4 proportional gain	0~2000	600	--	Y
F7-12	Kx3	PI available range 4 integral gain	0~2000	500	--	Y

Encoder Setup Parameters List

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

Control Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang
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
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
F9-13	Load Source Sel	Weighing source (0: SJT weighing, 1: -10-10V weighing, 2:0-10V weighing)	0/1/2	0	--	N
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

No-load Compensation Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang
FA-00	StratKP	Start-up proportional gain with no compensation.	0~50000	30	--	N
FA-01	StratKI	Start-up integral gain with no compensation	0~50000	750	--	N
FA-04	ZeroKeepKP	Proportional gain of zero speed keeping	0~2000	180	--	N
FA-05	ZeroKeepKI	Integral gain of zero speed keeping	0~10000	550	--	N
FA-08	PLKP1	No compensation effect proportional gain 1	1~6500	2500	--	N
FA-09	PLTime	No compensation effect time	1~1000	900	ms	N
FA-11	PLKP2	No compensation effect proportional gain 2	0~50000	800	--	N
FA-12	PLKPMOD	No compensation effect proportional factor	0~50000	125	--	N

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.

Special Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Chang
FC-00	Zpulse_Init	Result of motor angle tuning, same as FX-00.	0~3277	--	N
FC-07	Kplreg	Current ring proportional (FX-07), MODIFY WITH CAUTION!	0~65535	10000	N
FC-08	Kxlreg	Current ring integral (FX-08), MODIFY WITH CAUTION!	0~65535	5000	N
FC-13	AutoTuneModeSel	Sine/Cosine PG card auto-tuning selection (FX-20): 0: Rotation; 1: Stationary;	0/1	0	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
FC-16	CD DirSel	FC15 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

Environment Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Chang
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	0000000	Y
A0-04	Contrast	Setting the LCD contrast level	0~10	5	N

Appendix V Elevator System Faults

Chart 3.1 Elevator System Fault List

Error Code	Definition	Possible Solution
Er2	Door inter-lock faults: Door inter-lock circuit open at elevator running	Check the work condition of door vane and door interlock circuit. Roller should have enough space at both side of the vane.
Er3	Driver faults	Check drive error code. Determine the possible cause of the fault and solve in corresponding solution.
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.
Er5	System does not receive brake open feedback signal System does not receive brake open feedback signal after system has output brake open command. 1. After Y3 has output, no feedback signal at X5 (feedback signal of brake relay) after 0.5s, or no feedback signal at X6 and X15 (feedback switches of brake arms) after 2s; 2. X5, X6 or X15 is valid, when Y3 has no output.	1. Check brake feedback switches and its wiring; 2. If there is no feedback switch at brake arms, the Brake Feedback shall be set to OFF.
Er6	During elevator running, leveling zone input signal X9, X10 is always on.	Check leveling zone signal circuit and induction switch
Er7	Inverter pulse not enough at elevator running.	Check the wiring from encoder to controller.
Er9	KDY fault: Contactor KDY output not matching feedback signal: 1. After Y5 output X16 no feedback in 0.4s. 2. X16 is enable when Y5 has no output.	Check the contactor KDY coil and output/feedback circuit wiring.
Er10	Safety circuit open, input X13, X29 is invalid.	Check all safety circuits.
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.
Er12	Elevator pass top limit switch (X5 is invalid)	Check encoder, top limit switch including its position / wiring.
Er13	Elevator pass bottom limit switch (X6 is invalid)	Check encoder, bottom limit switch including its position / wiring.
Er14	Floor counter error from encoder deviation accumulation: after this error, elevator will return to bottom floor in inspection speed for recalibration.	1. Check encoder wiring and related circuits; 2. Check the leveling switch and related circuits; 3. Possible reason: traction rope slip /door drive shake at start.
Er17	No drive output after running command.	Check parameters in controller or contact supplier.
Er18	Floor number error: after this error, elevator will return to bottom floor in inspection speed for recalibration.	Check the encoder and its wiring.
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; make elevator running curve steeper; reduce speed adjusting distance; 2. Do hoistway parameter learning again.
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 the proportion parameter of controller; Check the braking resistor specification; 2. Make elevator running curve smoother; 3. Do hoistway parameter self-learning.
Er21	Single running time is over set time	1. Check related parameters in controller; 2. Check the traction rope for slip or car jam; 3. Check value of parameter "Over Time".
Er22	Elevator has inspection signal input (X0 invalid) at elevator normal running.	Check inspection switch and related circuits.
Er23	One of two leveling switch (X9, X10) is invalid at elevator normal running.	Check leveling switches and wirings.
Er25	Heat sensor protection: Braking resistor or motor is over heat (X4 invalid).	Check heat sensor circuit. If this error cannot reset in 90s, Y0 relay on controller will output KMC contactor open signal.

Chart 3.1 Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution
Er25	Heat sensor protection: Braking resistor or motor is over heat (X4 invalid).	Check heat sensor circuit. If this error cannot reset in 90s, Y0 relay on controller will output KMC contactor open signal.
Er26	Door interlock error , door interlock contactor working state does not match with its coil (X14 and X30 input inconsistent; if F4-06-12 is enable, X14, X30 and X31 input inconsistent).	Check the consistency of door interlock contactor's coil and its contact with respect to the input ports of main board.
Er27	Emergency stop fault: Emergency stop contactor working state does not match its coil state. (X13, X29 input different)	Check emergency stop contactor terminal & coil and their related terminal on controller.
Er28	Top/bottom terminal (1st or 2nd) adhesions. (X7 or X8 valid when elevator outside their floor)	Terminal invalid in corresponding floor. Check terminal signals.
Er29	Communication interference too much (In system or in duplex communication).	1. Check system ground condition; Eliminate interference. 2. Check COP/LOP for possible damage that may influence CAN BUS communication.
Er30	Door open fault (car cannot open door)	1. Run elevator in inspection mode, give door open command and check Y4 for output signal; 2. If Y4 has no output, need to check door open, close limit switch and related signal; 3. Be aware whether front door and rear door setting is opposite when two door mode is used.
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.
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.
Er33	Motor star-sealed contactor fault	Star-sealed Contactor fault: Star-sealed Contactor command not match feedback signal: 1. Y4 output, X11 has no feedback in 0.4s 2. Y4 has not output, X11 is valid 3. Y4 has been cancelled, X11 has no feedback in 0.4s.
Er34	External switching power supply 24V sag fault	1. Check External switching power supply 24V connection; 2. Fault prompt given if detect the external voltage is lower than 16V.
Er35	Master clock error	Main board hardware circuit working abnormal. Please contact supplier.
Er36	Internal power supply 5V error	Fault prompt given if detect the 5V voltage is lower than 4.7V.
Er37	KDY vibrate while running with brake open	Check the action of KDY contractor and its feedback X16.
Er38	KFX vibrate while running with brake open	Check the action of SC contractor KFX and its feedback X11.
Er50	Unreasonable parameters setting	Possible reason: 1. Base floor or fire floor or parking floor has been set to non-stop floor; 2. Both duplex control and group control are enabled; 3. Two door mode, both front door and rear door are disable for one floor; 4. Two door mode is set to 1, but both sides are set to enable for one floor.
Er52	The door zone sensors are converse.	Reverse up and down door zone signal wires.
Er53	The minimum speed change distance is less than the door zone segment magnetic plate.	Increase the minimum running speed of single floor.
Er62	Disable X31 as car door detection point but X31 is effective; Or disable door inter-lock detection but X14 is effective.	1. Check if X31 is effective when F4-06-12=OFF; 2. Check if X14 is effective when F4-06-13=ON.
Er97	Hardware incompatible.	Please contact with factory.
Er98	Drive side program locked.	None unlock after upgrade. Please return to factory or contact with factory.
Er99	Logic side program locked.	None unlock after upgrade. Please return to factory or contact with factory.

Appendix VI Driver Fault

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)	<ol style="list-style-type: none"> 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 invalid. 	<ol style="list-style-type: none"> 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)	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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;	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check output short circuit; 2. Check motor short circuit; 3. Check star-sealed contactor action; 4. Contact with supplier.
DF5	OC	Overcurrent Phase current of controller has exceeded limit and keep for certain time	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 (Gearless); (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.

DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF7	OS	Elevator over speed the speed feedback exceeds the speed limit and last longer than set time.	<ol style="list-style-type: none"> 1. Max speed /last time set incorrect; 2. Speed over-tuning; 3. Encoder feedback incorrect; 4. Wrong motor parameters setting. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.
DF9	PGO	PG disconnect Did not receive encoder signal at operation. PG card type setting is different with actual one, system cannot identify it.	<ol style="list-style-type: none"> 1. Encoder wiring is broken, loosen or wrong connection; 2. Encoder damaged; 3. Wrong PG type setting; 4. PG card damaged; 5. Brake not open. 	<ol style="list-style-type: none"> 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	Baseblock circuit error When system find baseblock valid and receive running command, but running condition isn't ready.	<ol style="list-style-type: none"> 1. Wiring for baseblock at X14 is incorrect; 2. Setting electric level for baseblock at X14 is incorrect. 	<ol style="list-style-type: none"> 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).	<ol style="list-style-type: none"> 1. System load too heavy; 2. System power rating too low; 3. Low capacity controller. 	<ol style="list-style-type: none"> 1. Reduce system load; 2. Change a more suitable controller; 3. Change motor or increase F5-08 rated current properly to promote overload capacity.
DF13	MC	MC contactor bad action Controller main contactor MC does not close after given close command for set time.	<ol style="list-style-type: none"> 1. Wrong wiring for MC contactor; 2. MC contactor damaged; 3. Wrong FX-23 surge feedback type setting; 4. Drive power on power board is abnormal. 	<ol style="list-style-type: none"> 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.

DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF14	BR	Brake unit fault While system find DC bus voltage reach braking range, but braking tube keep open and last over preset time.	<ol style="list-style-type: none"> defective brake cable or damaged brake elements or IGBT module; External brake resistor disconnected or not connected; Bad connection between the main board and the power board. 	<ol style="list-style-type: none"> Check brake resistor; Replace the controller; 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	<ol style="list-style-type: none"> Output cable break or loose terminal; Motor stator cable disconnected. 	<ol style="list-style-type: none"> Check output cable/terminal; Check motor stator cable; 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.	<ol style="list-style-type: none"> Controller damaged; Cabinet works abnormally. 	<ol style="list-style-type: none"> Change the controller; Check cabinet wiring.
DF17	SRF	Elevator slips after stop After the system executes the stop command, the encoder's feedback speed is not zero.	<ol style="list-style-type: none"> Brake/encoder loose; Encoder interference. 	<ol style="list-style-type: none"> Fasten brake/encoder; Remove interference source.
DF18	UF	Incremental: Signal U of encoder wire lost Sin/Cos: Signal C and D abnormal	<ol style="list-style-type: none"> Encoder damaged or wiring incorrect; Wrong PG type setting. 	<ol style="list-style-type: none"> Check encoder and wirings; Correct PG type setting.
DF19	VF	Incremental: Signal V of encoder lost Sin/Cos: A, B, C, D signals are highly similar	<ol style="list-style-type: none"> Encoder damaged or wiring incorrect; Wrong PG type setting. 	<ol style="list-style-type: none"> Check encoder and wirings; Correct PG type setting.
DF20	WF	Incremental: Signal W of encoder wire lost Sin/Cos: Abnormal communication between SPG card and main board	<ol style="list-style-type: none"> Encoder damaged or wiring incorrect; Wrong PG type setting; Bad connection between the main board and the PG card. 	<ol style="list-style-type: none"> Check encoder and wirings; Correct PG type setting; 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.	<ol style="list-style-type: none"> Bad contact between main board and drive power; Hardware error. 	<ol style="list-style-type: none"> Please with contact supplier; Check the main board and driver power board connection.

DRIVER FAULT LIST (CONT'D)

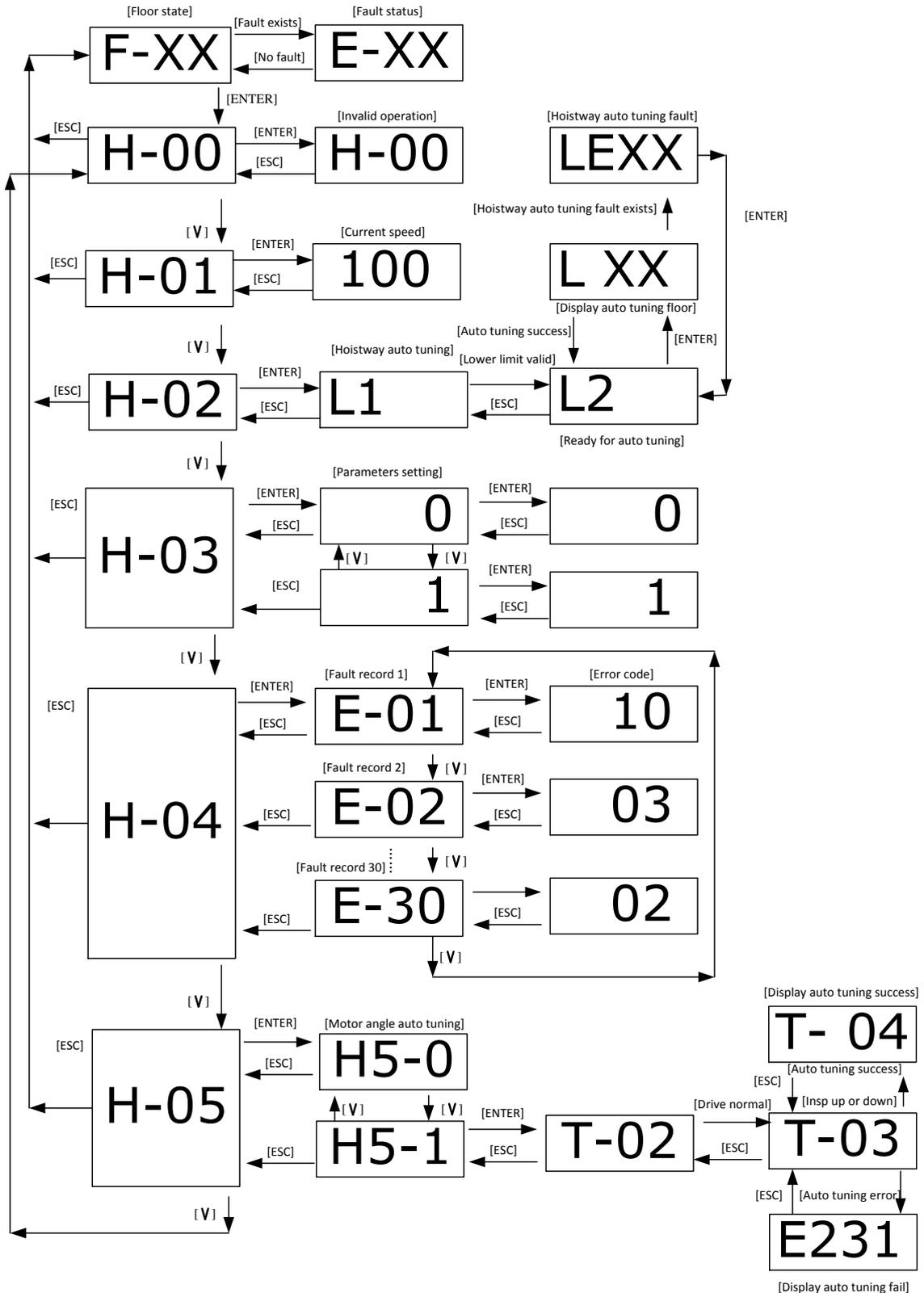
Error Code	Display	Definition	Possible Causes	Possible Solution
DF24	151	Overtime at zero speed The system has detected that the elevator controller has been given a zero-speed state and exceeds the zero-speed timeout time.	Drive controller keep too long time under zero speed.	Check if inspection speed or rated speed is reasonable.
DF25	152	Baseblock error System detect baseblock 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.
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.
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.

DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check 3-phase output and output to earth and output to N line; 2. Check if inverter capacity adapts to motor. <p>Note: Set FD-21. BIT3=1 can ignore this error, but we don't suggest doing that. Because it has risk to burn module.</p>
DF38	165	Imbalance of 3-phase output System find the summation of 3-phase current is not zero and last for certain time.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.

Appendix VII Menu operation processes with Digital tubes & operation keys

keys



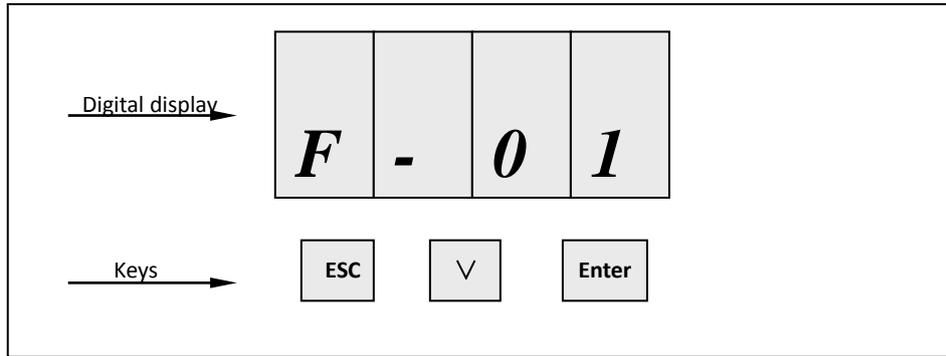


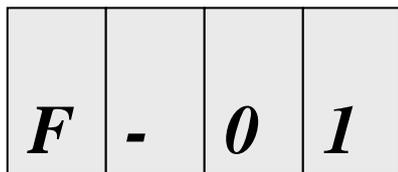
Figure Display and key layout

ESC : cancel/return key;

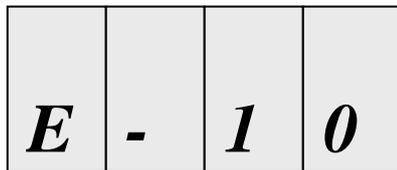
▽ : Flip key;

ENTER: OK key;

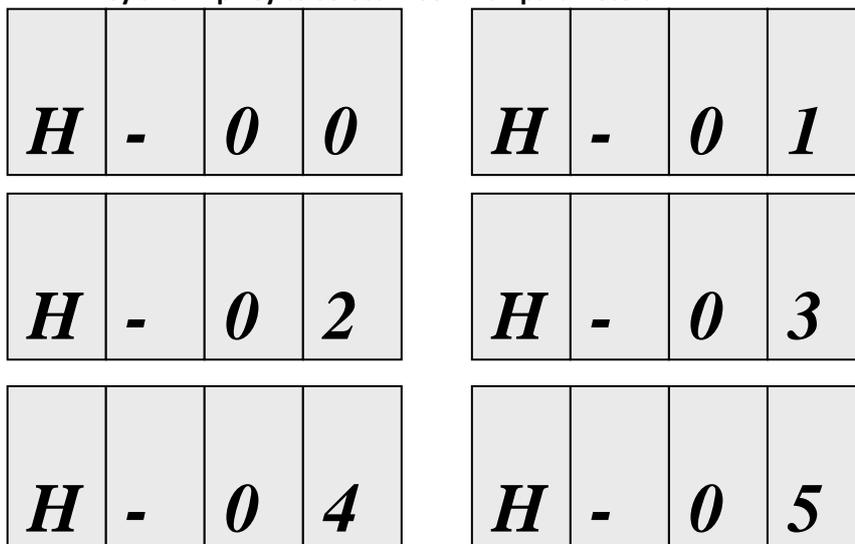
1、 Normally, display current floor F-XX:



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

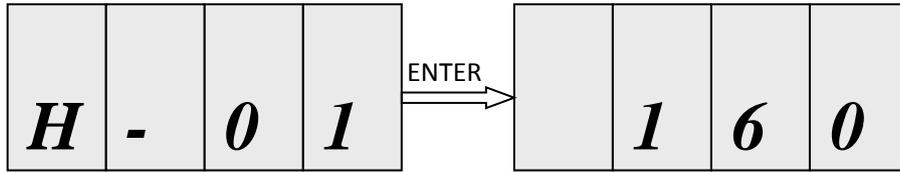


3、 Press ENTER key and Flip key to select H-00~H-04 parameters:

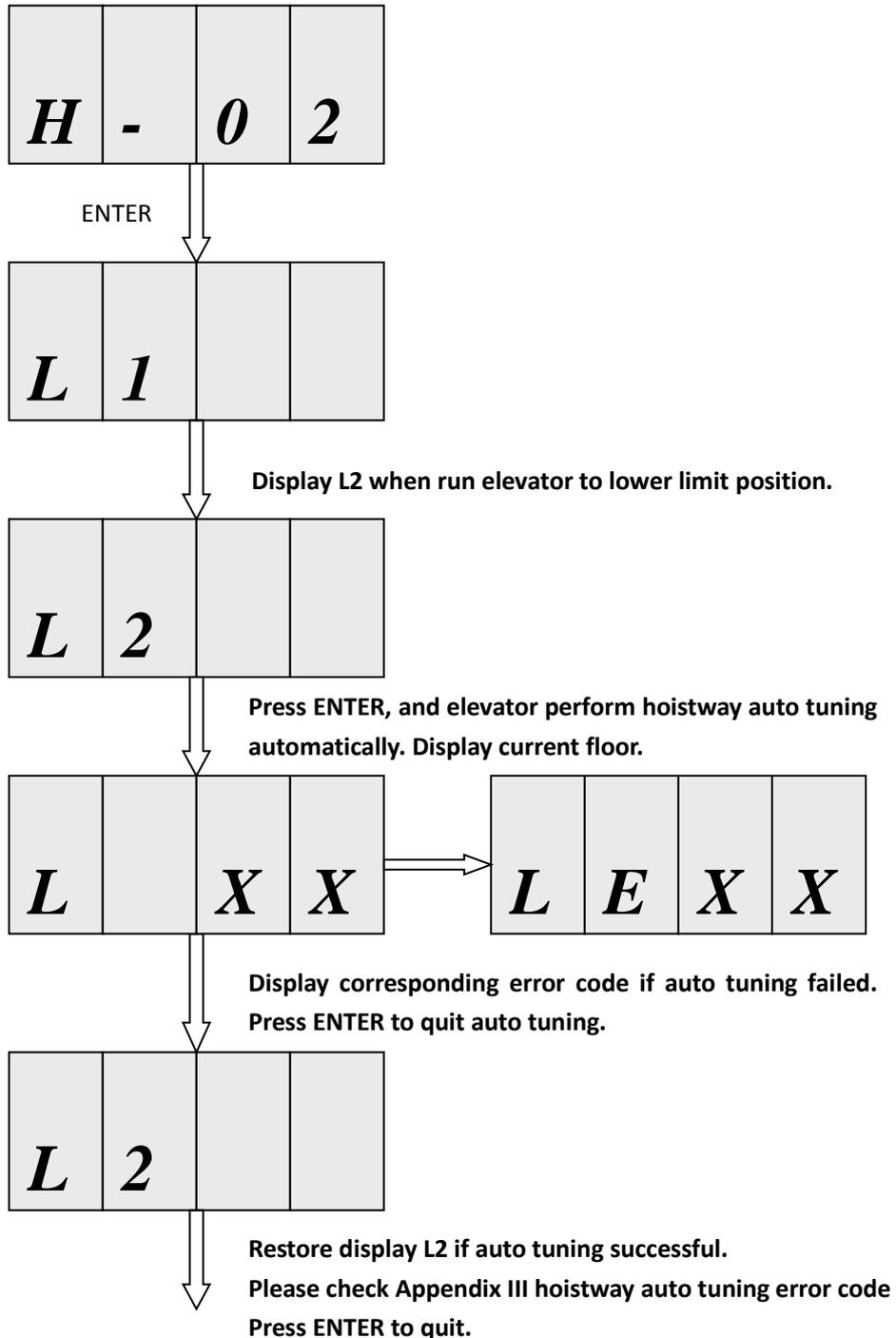


4、H-00: Invalid parameter;

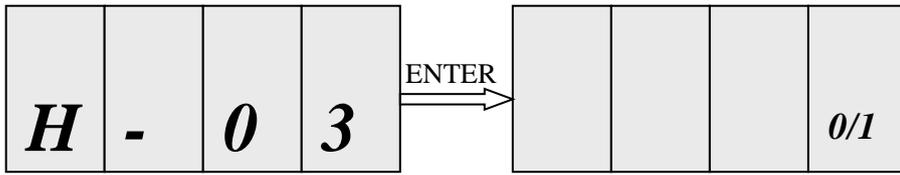
5、H-01: Display current running speed (Unit: cm/s):



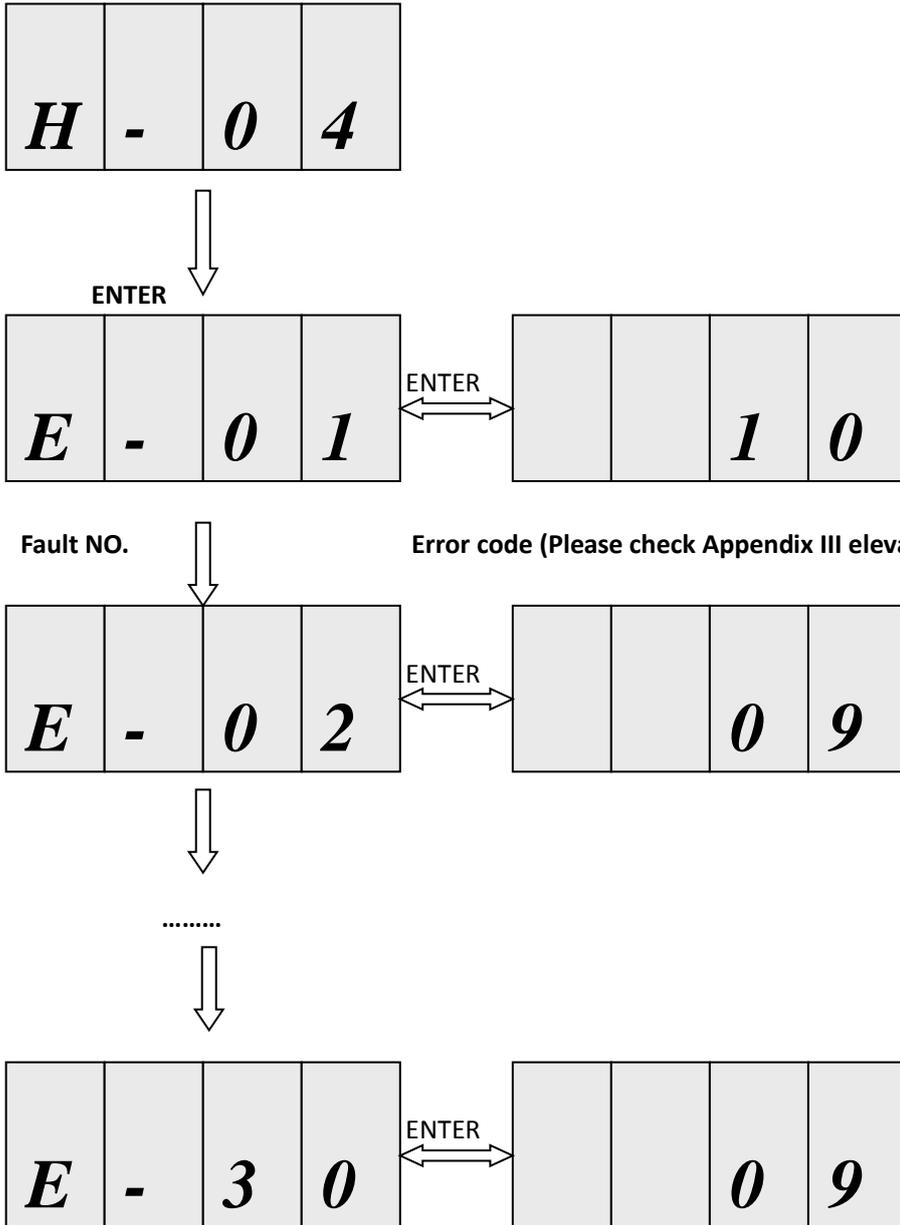
6、H-02: Hoistway parameter self-learning:



7、 H-03: Parameters setting with hand operator. Set once the parameter when connecting hand operator. (Set this parameter again to support hand operator after main board reset).



8、 H-04: View 30 fault recodes.



9、H-05: Motor static angle auto tuning

<i>H</i>	<i>-</i>	<i>0</i>	<i>5</i>
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<i>H</i>	<i>5</i>	<i>-</i>	<i>0/1</i>
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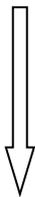
Choose 1, press ENTER to enter motor auto tuning mode.

<i>T</i>	<i>-</i>	<i>0</i>	<i>2</i>
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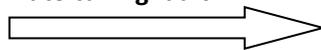
After drive microcontroller answer normal, display is shown below:

<i>T</i>	<i>-</i>	<i>0</i>	<i>3</i>
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Keep pressing jog up or jog down to rotate motor 3 circles.

Auto tuning fault



<i>E</i>	<i>X</i>	<i>X</i>	<i>X</i>
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Handling according to error information prompted.

<i>T</i>	<i>-</i>	<i>0</i>	<i>4</i>
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Auto tuning normal.

Press ENTER to exit.