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1 BL6-U Parallel Integrated Controller Model & Specifications

1.1 Model description

Model description of BL6-U Parallel Integrated Controller is shown as figure 1(take 22KW closed type controller as example).

Specifications list in chart 1.

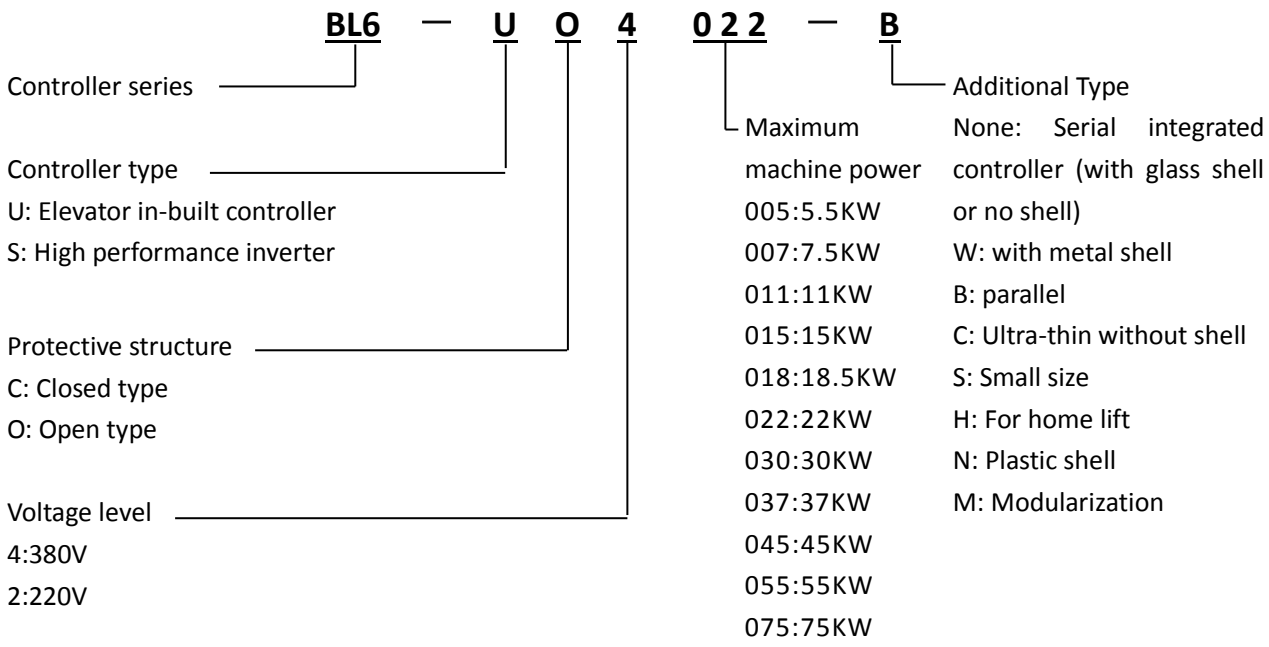


FIGURE 1.1 MODEL DESCRIPTION DIAGRAM

1.2 Specifications

Specifications of BL6-U Parallel Integrated Controller in chart 1.

CHART 1.1 SPECIFICATIONS

	Model BL6—U□40□□-B	4005	4007	4011	4015	4018	4022	4030	4037	4045
		4055	4075							
	Max motor capacity(KW)	5.5	7.5	11	15	18.5	22	30	37	45
		55	75							
Rated output	Rated output capacity(KVA)	9	12	18	22	27	32	43	53	63
		78	106							
	Rated output current(A)	14	18	27	34	41	48	65	80	96
		128	165							
	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)	17	22	32	41	49	58	78	96	115
		147	190							
	Allowable voltage fluctuation	±15%								
	Allowable freq fluctuation	±5%								

	Model BL6—U□20□□-B	2003	2005	2007	2011	2015	2018	2022
	Max motor capacity(KW)	3.7	5.5	7.5	11	15	18.5	22
Rated output	Rated output capacity(KVA)	7	10	14	20	27	33	40
	Rated output current(A)	17	25	33	49	66	80	96
	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)	21	27	40	52	68	92	110
	Allowable voltage fluctuation	+10%, -15%						
	Allowable freq fluctuation	±5%						

Basic features	Elevator control mode	Simplex Collective, Duplex Collective, 3~8 units Group Control
	Elevator speed range	0.5~4m/s
	Applicable highest floors	15 levels
	Applicable elevator type	Passenger, Hospital, Panoramic, Goods, Villa Elevator
	Applicable motor	Gear Traction Machine, Gearless Traction Machine
	Communication mode	CAN bus serial communication
	Leveling accuracy	≤3mm
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℃±10℃)
	Speed response	30Hz
	Torque limit	Yes (Set by parameters)
Drive control features	Torque accuracy	±5%
	Frequency control range	0~120Hz
	Frequency accuracy	Digital Ref: ±0.01% (-10℃~+40℃)
	Frequency Ref resolution	Digital Ref: 0.01Hz
	Output Freq resolution	0.01Hz
	Overload capacity	150% rated current 60s; 180% rated current 10s
	Starting torque	180% rated current 0Hz
	Deceleration time	0.001~600s

CHART 1.1 SPECIFICATIONS (Cont'd)

DRIVE CONTROL FEATURES	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	46-CHANNEL SWITCHES: RATED LOAD 7MA/DC24V, UPPER FREQ 100HZ
	HIGH OPTO-ISOLATED INPUTS	2-CHANNEL SWITCHES: RATED LOAD 8MA/AC110V, UPPER FREQ 100HZ
	PROGRAMMABLE RELAY OUTPUT	24-CHANNEL SWITCHES:1NO, CONTACT CAPACITY 5A/30VDC,5A/250VAC
	CAN COMMUNICATION INTERFACE	1 CHANNEL:(DUPLEX/GROUP CONTROL, REMOTE WIRELESS MONITORING)
	RS232 COMMUNICATION INTERFACE	2 CHANNELS: DIGITAL OPERATOR/PC MONITORING/PROGRAMMABLE INTERFACE; SECURITY DOG COMMUNICATION
DISPLAY	DIGITAL OPERATOR	LCD DISPLAY IN CHINESE/ENGLISH
	MONITORING SOFTWARE INTERFACE	MENU/PARAMETER/STATE/VARIABLE TIMING/DIGITAL OSCILLOSCOPE ETC.
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	STOPS AT DC BUS VOLTAGE OVER 720V (400V DRIVE) OR 410V (200V DRIVE)
	UNDERVOLTAGE PROTECTION	STOPS AT DC BUS VOLTAGE UNDER 380V (400V DRIVE) OR 190V (200V DRIVE)
	HEATSINK OVERHEAT PROTECTION	PROTECT BY THERMISTORS
	IGBT INTERNAL PROTECTION	IGBT 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
	SAFETY CIRCUIT FAULT	PROTECT AT SAFETY CIRCUIT OPEN WHEN RUNNING
	BRAKE FAULT	NO BRAKE OPEN FEEDBACK SIGNAL AFTER OUTPUT BRAKE OPEN COMMAND
	LEVELING ZONE SIGNAL FAULT	PROTECT AT LEVELING ZONE SIGNAL FAULT
MAIN PROTECTION FUNCTIONS	OUTPUT CONTACTOR FAULT	PROTECT AT OUTPUT CONTACTOR FAULT
	RUNNING TIME PROTECTION	PROTECT AT SINGLE RUNNING TIME EXCEEDS LIMIT
	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
	AMBIENT TEMPERATURE	-10°C~+40°C
USING AMBIENT	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/S²; 20~50HZ, <2M/S²

2 BL6-U Parallel Integrated Controller Main Board Terminals

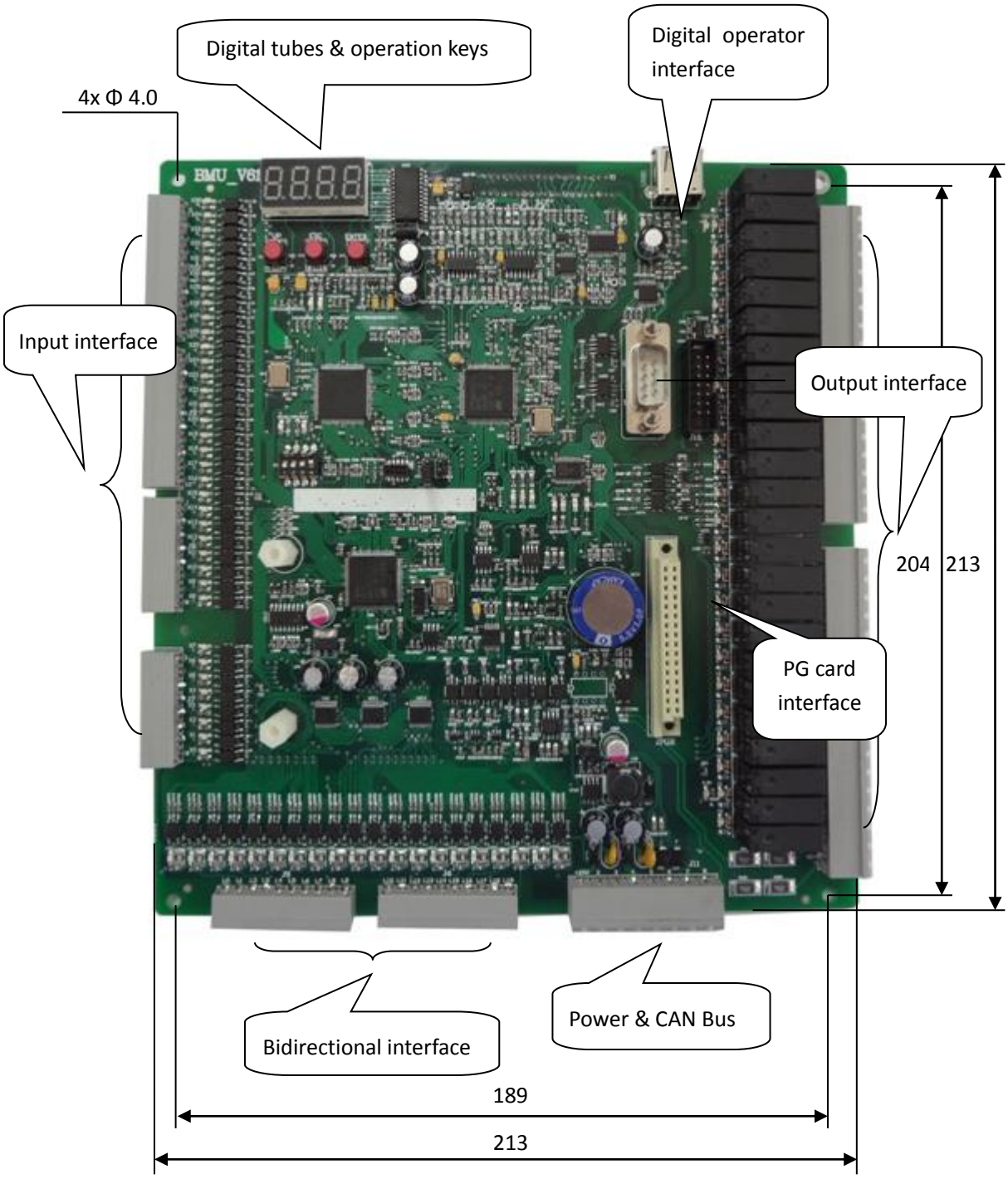


FIGURE 2.1 TERMINAL ARRANGEMENTS FOR CONTROL CIRCUIT

CHART 2.1 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	X36+	J1-1	Door inter-lock input + (110V-220VAC)	Input	OC	AC110V 8mA	10mS	100Hz
	X36-	J1-2	Door inter-lock input – (110V-220VAC)					
	Y0	J1-3	KBC brake output	Output	Relay	DC10A30V AC10A250V	5/10mS	20cpm
	Y1	J1-4	KDY auxiliary contact output					
	COM1	J1-5	Y0-Y1 common terminal					
	Y2	J1-6	KKM Door open 1 control output					
	Y3	J1-7	KGM Door close 1 control output					
	Y4	J1-8	KKM2 door open 2 control output					
J2	Y5	J2-1	KGM2 door close 2 control output	Output	Relay	DC10A30V AC10A250V	5/10mS	20cpm
	CM2	J2-2	Y2-Y5 common terminal					
	Y6	J2-3	KXFL fire linkage output					
	Y7	J2-4	Illumination switch-off output					
	Y8	J2-5	KDZZ arrival gong output					
	CM3	J2-6	Y6-Y8 common terminal					
	Y9	J2-7	Ea low 7 segment code a display					
	Y10	J2-8	Eb low 7 segment code b display					
J3	Y11	J3-1	Ec low 7 segment code c display	Output	Relay	DC10A30V AC10A 250V	5/10mS	20cpm
	Y12	J3-2	Ed low 7 segment code d display					
	Y13	J3-3	Ee low 7 segment code e display					
	Y14	J3-4	Ef low 7 segment code f display					
	Y15	J3-5	Eg low 7 segment code g display					
	Y16	J3-6	EHbc high 7 segment code bc display (Inspection output when floor display is not in 7-seg-code mode. when floor display is in 7-seg-code mode, and the high bit is not used, Inspection output can be set by function code FU-05)					
	Y17	J3-7	EHg high 7 segment code g display					
	Y18	J3-8	ES up arrow display					
J4	Y19	J4-1	EX down arrow display	Output	Relay	DC 10A30V AC 10A250V	5/10mS	20cpm
	CM4	J4-2	Y9~Y19 common terminal					
	Y20	J4-3	Cut-off power after parking (disabled output after parking)					
	Y21	J4-4	ECZ overload output					
	Y22	J4-5	FMQ buzzer control output					
	CM5	J4-6	Y20~Y22 common terminal					
	Y23	J4-7	Cut main contactor output					
	CM6	J4-8	Y23 common terminal					
J5	I0	J5-1	SKYC door open delay input					
	I1	J5-2	Full Collective/Simplex Collective Car call input 1/ Car call input 1					
	I2	J5-3	Full Collective/Simplex Collective Car call input 2/ Car call input 2					
	I3	J5-4	Full Collective/Simplex Collective Car call input 3/ Car call input 3					

CHART 2.1 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
J5	I4	J5-5	Full Collective/Simplex Collective Car call input 4/ Car call input 4	Input Output	Input: Optical-couple Output: OC	Input: DC 24V 7mA Output: 300mA	Input: 10mS	Input: 100Hz
	I5	J5-6	Full Collective/Simplex Collective Car call input 5/ Car call input 5					
	I6	J5-7	Full Collective/Simplex Collective Car call input 6/ Car call input 6					
	I7	J5-8	Full Collective/Simplex Collective Car call input 7/ Car call input 7					
	I8	J5-9	Full Collective/Simplex Collective Call up input 1/ Car call input 8					
	I9	J5-10	Full Collective/Simplex Collective Call up input 2/ Car call input 9					
J6	I10	J6-1	Full Collective/Simplex Collective Call up input 3/ Call input 1	Input Output	Input: Optical-couple Output: OC	Input: DC 24V 7mA Output: 300mA	Input: 10mS	Input: 100Hz
	I11	J6-2	Full Collective/Simplex Collective Call up input 4/ Call input 2					
	I12	J6-3	Full Collective/Simplex Collective Call up input 5/ Call input 3					
	I13	J6-4	Full Collective/Simplex Collective Call up input 6/ Call input 4					
	I14	J6-5	Full Collective/Simplex Collective Call down input 2/ Call input 5					
	I15	J6-6	Full Collective/Simplex Collective Call down input 3/ Call input 6					
	I16	J6-7	Full Collective/Simplex Collective Call down input 4/ Call input 7					
	I17	J6-8	Full Collective/Simplex Collective Call down input 5/ Call input 8					
	I18	J6-9	Full Collective/Simplex Collective Call down input 6/ Call input 9					
	I19	J6-10	Full Collective/Simplex Collective Call down input 7/ Call input 10					
J7	X0	J7-8	SJX Inspection/auto input					
	X1	J7-7	SSXW up limit input					
	X2	J7-6	SXXW down limit input					
	X3	J1-5	SSMQ up leveling input					
	X4	J1-4	SXMQ down leveling input					
	X5	J1-3	SKDY auxiliary contactor input					
	X6	J1-2	KBC brake contactor feedback					
	X7	J1-1	Door open limit 2 input					
J8	X8	J8-8	Door close limit 2 input					
	X9	J8-7	Safe plates 2 input					
	X10	J8-6	SJT Emergency stop input					
	X11	J8-5	SMB door inter-lock input					
	X12	J8-4	Left brake feedback input					
	X13	J8-3	SXF fire input					
	X14	J8-2	SMS jog up input (Attendant up)					
	X15	J8-1	SMX jog down input (Attendant down)					

CHART 2.1 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
J9	X16	J9-10	SSDZ top terminal input	Input	OC	DC24V 7mA	10mS	100Hz
	X17	J9-9	SXDZ bottom terminal input					
	X18	J9-8	ARD input					
	X19	J9-7	SKM door open signal input 1					
	X20	J9-6	SGM door close signal input 1					
	X21	J9-5	SKMW1 door open limit input 1					
	X22	J9-4	SGMW1 door close limit input 1					
	X23	J9-3	STAB1 safe plate 1 input					
	X24	J9-2	SDS electronic lock signal input					
	X25	J9-1	SCZ over-load input					
J10	X26	J10-10	SMZ full-load input	Input	OC	DC 24V 7mA	10mS	100Hz
	X27	J10-9	Spare/ Re-leveling condition input					
	X28	J10-8	Light-load anti-nuisance input/ Rear door lock detection					
	X29	J10-7	SZH Attendant input					
	X30	J10-6	SZS Bypass drive input					
	X31	J10-5	Right brake feedback input					
	X32	J10-4	Thermal switch input					
	X33	J10-3	SKM2 door open input 2					
	X34	J10-2	SGM2 door close Input 2					
	X35	J10-1	Standby/ Re-leveling sensor input					
J11	+24V1	J11-1	Input common terminal					
	24V_GND	J11-2, J11-3	Input power ground	Power	Power	DC24V10A		
	+24V	J11-4	Input power					
	AG0 IN	J11-5	Analog input	Input	Analog	-10V~+10V		
	GND1	J11-6	Input ground	Analog input ground				
	1H	J11-7	Duplex/Group control communications +	Communication Interface	CAN	80mA		25Khz
	1L	J11-8	Duplex/Group control communications -					

3 PG Card Terminals & Assemblage

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

3.1 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.

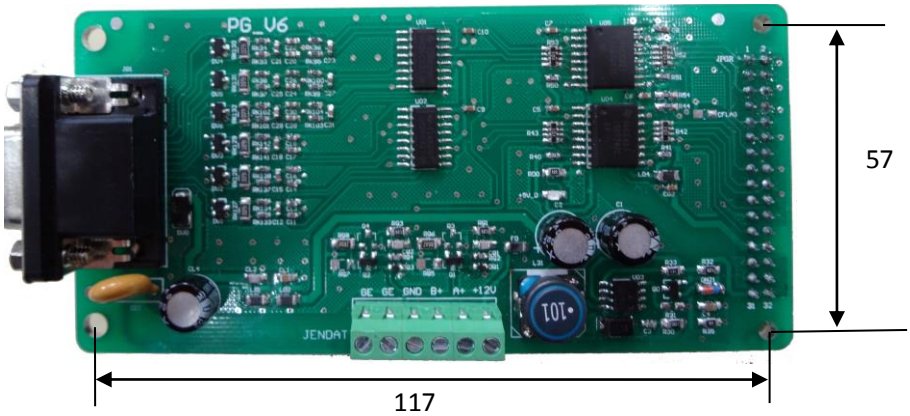


FIGURE 3.1 PG_V6 CARD

FIGURE 3.1 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

3.2 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.

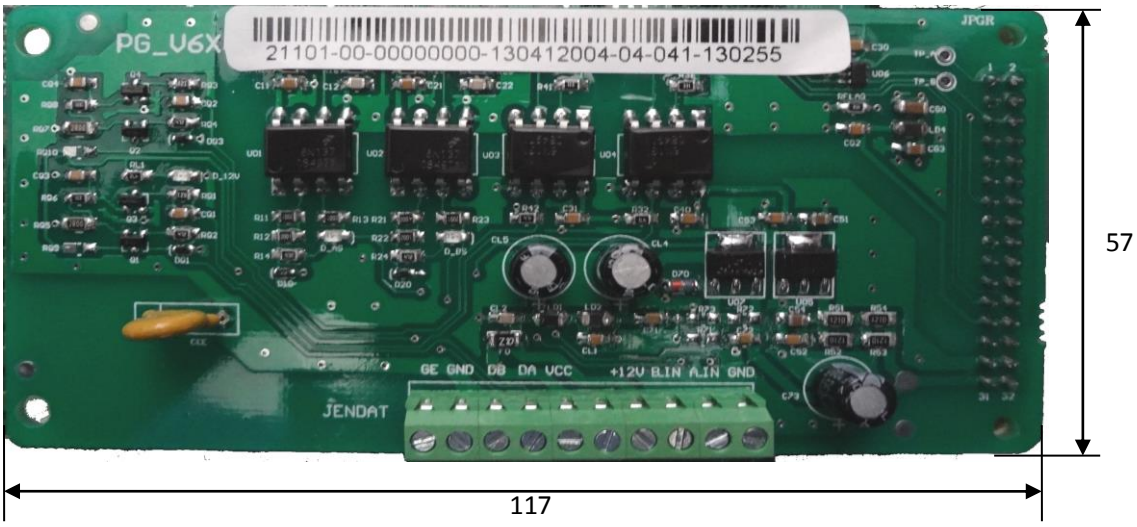


FIGURE 3.2 PG_V6X CARD

FIGURE 3.2 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		—		

3.3 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 3.3 below for detail.

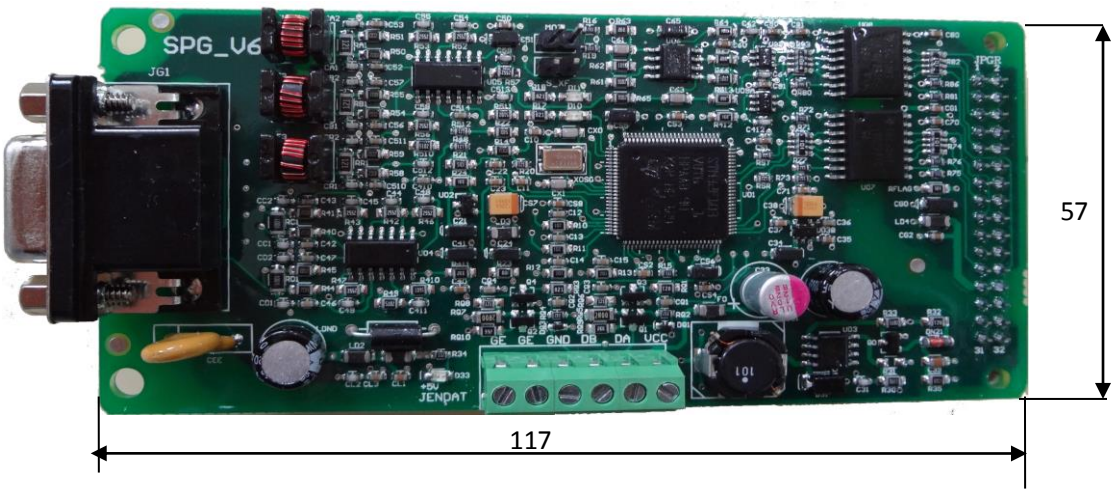


FIGURE 3.3 SPG_V6 CARD

FIGURE 3.3 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	—	—	—			

3.4 SPG_V6E

SPG_V6E 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/C/D. (Suitable for ECN1313)

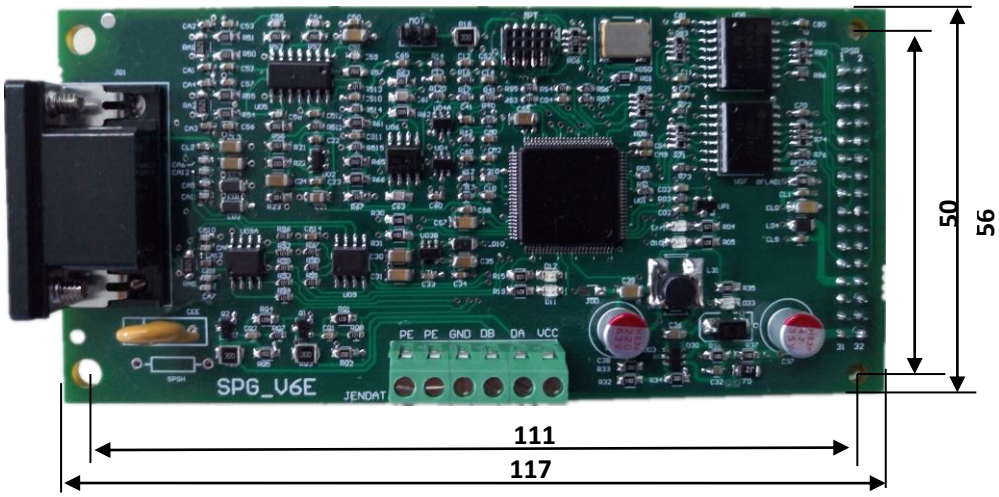


FIGURE 3.4 SPG_V6E CARD

CHART 3.4 SPG_V6E TERMINAL DEFINITION & FUNCTION

Terminal Name	Terminal Mark	Location	Definition	Usage	Interface Technical Specification			
					Interface Type	Rated Capacity	On/Off Time	Max Speed
JENDAT	+12V	JEN -1	OC / push-pull Power Supply	12V power supply	Power output	+150mA/12V ±5%		
	A+	JEN -2	Frequency signal OC output A	Sync-frequency division	OC/ push-pull output	±50mA		500KHZ
	B+	JEN -3	Frequency signal OC output B	Sync-frequency division	OC/ push-pull output	±50mA		500KHZ
	0V	JEN -4	Power supply ground	Power ground	Power ground	--		
	PE	JEN -5	Shield ground	Shield ground	D-output	--		
	PE	JEN -6	Shield ground	Shield ground	PGND	--		
JG1	B-	JG1-1	B-	Differential signal B-	Differential input			40KHz
	*	JG1-2	--	--	--			
	*	JG1-3	*	JG1-2	--	--	--	
	*	JG1-4	*	JG1-2	--	--	--	
JG1	A+	JG1-5	A+	Differential signal A+	D-input			40KHz
	A-	JG1-6	A-	Differential signal A-	D-input			40KHz
	0V	JG1-7	GND	5V Ground	PGND			
	B+	JG1-8	B+	Differential signal B+	D-input			40KHz
	5V	JG1-9	+5V	5Vpower	Power output	+500mA/5V± 2.5% Voltage ripple<50mV		
	C-	JG1-10	Clock-	Differential signal C-	D-input			40KHz
	C+	JG1-11	Clock+	Differential signal C+	D-input			40KHz
	D+	JG1-12	Data+	Differential signal D+	D-input/output			40KHz
	D-	JG1-13	Data-	Differential signal D-	D-input/output			40KHz
	*	JG1-14	--	--	--			
	*	JG1-15	--	--	--			

4 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 4.1 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, and the last part is the PG model.

The detail information is showing below

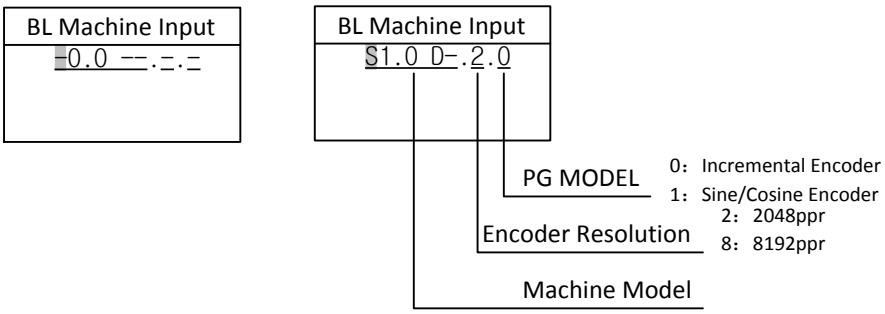


FIGURE 4.1 BL Machine Input Interface

Press [ENTER] button after entering complete motor and encoder information. BL series integrated controller automatically generates 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.

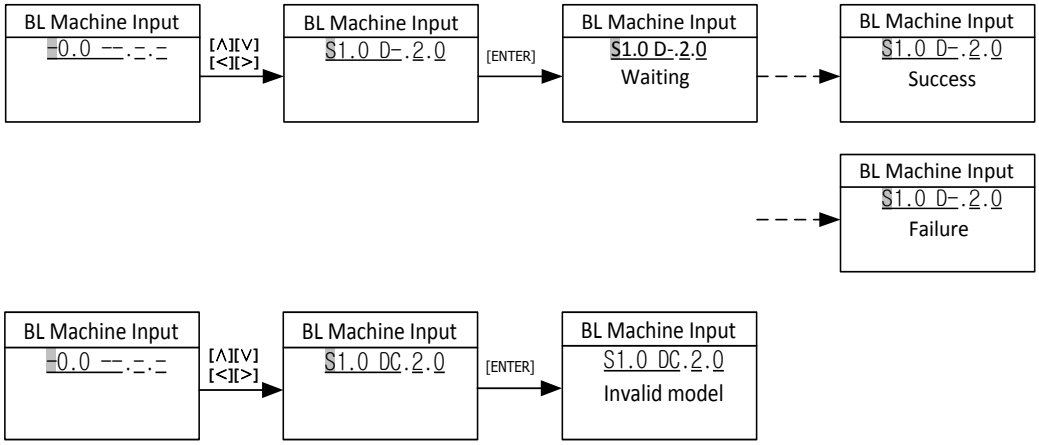


FIGURE 4.2 BL Machine Input Interface

5 Motor Initial Angle Tuning (Only for Synchronous Machine)

For machines without attached steel rope and no load, please follow section 1 “**Motor Initial Angle Tuning with no load**”. For machines attached with steel rope and have load, please follow section 2 "**Motor Initial Angle Tuning with loa**d".

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

5.1 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 Y1 (J1-4) and COM1 (J1-5) to make it close;

3) Connect brake contactor output Y0(J1-3) and COM3 (J1-5) to release the brake;

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

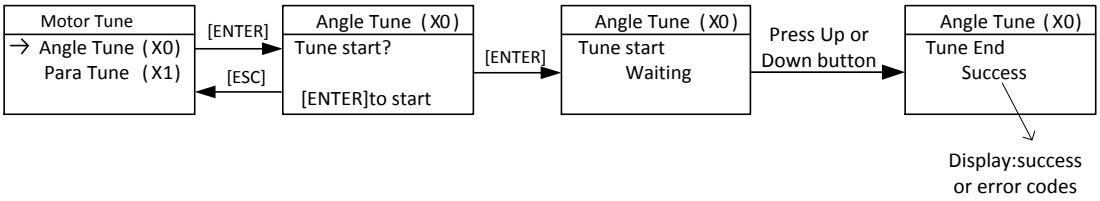


FIGURE 5.1 Motor initial tuning with no load (Do not attach steel ropes) sketch

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 seconds again, motor stops and indicates success. The whole tuning procedure lasts less than 20 seconds.

Chart 5.1 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.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far less than the drive).	1. Check parameters of motor and encoder; 2. Decrease F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.

Chart 5.1 Motor Initial Angle Rotation Tuning Fault List (Cont'd)

Error Code	Definition	Possible Causes	Possible Solution
RF227	**Output current over limit** During the tuning process, the driver controller detects that the output current has reached the limit and stops the output, indicating that the current is out of limit.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far more than the drive).	1. Check parameters of motor and encoder; 2. Increase F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF228	**ESC input** During the tuning process, ESC input is effective, and self-tuning is cancelled.	The hand operator triggers the ESC button to cancel angle tuning.	Angle tuning interruption, failure to complete, please do angle tuning again.
RF229	**Over time at zero speed** In the process of tuning, when the rotor is positioned, the feedback speed is not zero for a long time, and it cannot locate accurately.	1. Motor carrying partial load; 2. Bad feedback speed of encoder.	1. Ensure brake is off; 2. Remove interference of encoder.
RF231	**CD signals of encoder is abnormal** In the process of tuning, it is found that CD feedback position value is abnormal, and it is impossible to identify the CD line sequence.	1. Parameters of motor or encoder have been wrongly input; 2. Interference in encoder; 3. Error input of motor or encoder; 4. Wrong PG type set.	1. Check CD signals wiring; 2. Remove interference; 3. Verify parameters of motor and encoder; 4. Check PG type set.
RF232	**Motor does not rotate** In the process of tuning, the driver cannot control the normal rotation of the motor.	1. Encoder connection fault, no feedback speed; 2. Motor has load or brake close; 3. The power difference between the motor and the driver is too large and does not match.	1. Check encoder A&B signal connection, elimination of encoder signal interference; 2. Make sure motor has no load & brake open; 3. Check the parameters of the number of the motor and the number of the encoder; 4. Detect of power matching of motor and driver controller, reduce the rated current [F5-08], and resume F5-08 after tuning.
RF233	**Motor rotates in wrong direction** In the process of tuning, the direction of the motor is not consistent with the control direction, and there is a reverse rotation.	Motor phase sequences does not match encoder.	1. Adjust motor phase sequence; 2. Adjust encoder A-, A+ or B-, B+.
RF234	**Encoder R pulse signal error** R pulse signal was not detected for a long time in the process of tuning.	1. No detection of R pulse signal; 2. Interference of encoder signal; 3. Error input of motor or encoder; 4. In the course of tuning, the motor is rotated in distress.	1. Check wiring for R pulse signal; 2. Elimination of encoder signal interference; 3. Verifying the number of motor poles and the number of encoder lines; 4. Open or close the brake in the process of self-learning.

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.

5.2 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!

5.2.1 Motor Initial Angle Tuning with Digital 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:

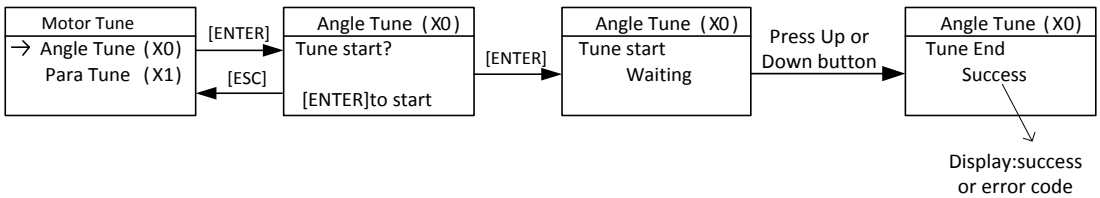


FIGURE 5.2 Motor initial tuning with load (attach steel ropes) sketch

After pressing "Enter", tuning starts. When digital operator indicates "waiting" , 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 5 seconds, 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 a test running period. Finally, release the jog up or down button and finish the tuning procedure.

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

Prefer to contents of appendix VII.

5.2.3 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 jog up or down 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 5.2 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.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far less than the drive).	1. Check parameters of motor and encoder; 2. Decrease F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF227	**Output current over limit** During the tuning process, the driver controller detects that the output current has reached the limit and stops the output, indicating that the current is out of limit.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far more than the drive).	1. Check parameters of motor and encoder; 2. Increase F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF228	**ESC input** During the tuning process, ESC input is effective, and self-tuning is cancelled.	1. Release Up or Down button while tuning; 2. Fault occurs during angle tuning.	1. Angle tuning interruption, failure to complete, please do angle tuning again. Do not forced to run, there is a danger of losing control. 2. Check whether there is elevator logic fault, resulting in stop tuning. Refer to **Chart 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	1. Brake open or brake force is not enough; 2. There's interference in encoder.	1. Ensure brake is off; 2. Remove interference of encoder.
RF230	**Current detection error** During the tuning process, the feedback current value ultra-lower limit and the self-tuning condition is not satisfied.	1. Broken circuit at load side or lack of phase; 2. Imbalance phase of motor side or rated current wrongly set; 3. Inverter cannot adapt to motor. (Motor capacity is highly lower than inverter)	1. Ensure 3-phase connection to motor; 2. Ensure motor parameters setting; 3. Ensure motor should adapt to inverter.
RF231	**CD signals of encoder is abnormal** In the process of tuning, it is found that CD feedback position value is abnormal, and it is impossible to identify the CD line sequence.	1. Parameters of motor or encoder have been wrongly input; 2. Interference in encoder; 3. Error input of motor or encoder; 4. Wrong PG type set.	1. Check CD signals wiring; 2. Remove interference; 3. Verify parameters of motor and encoder; 4. Check PG type set.

Chart 5.2 Motor initial Angle tuning with load (attach steel ropes) error code (Cont'd)

Error Code	Definition	Possible Causes	Possible Solution
RF237	**Motor moved while static angle calculation** When the motor angle position is inferred static, the motor cannot rotate to obtain the determined current position.	1. Brake open or brake force is not enough; 2. Bad encoder wire or interference in encoder.	1. Ensure brake is closed; 2. Check encoder A, B signals, remove interference
PF238	**Detection current is too small** In the Initial angle static tuning process, the output current value is lower than the lower limit, and the tuning condition is not satisfied.	1. The rated current of the motor may not be in conformity with the actual motor; 2. Motor/Controller connection is incorrect. (Break circuit or phase lost)	1. Check motor/controller connection; 2. Check rated current and rated power of motor.
PF239	**Encoder R pulse signal lost** No encoder R pulse signal detected after motor tuning for 10s	1. Interference in R pulse signal; 2. A & B signals connection error; 3. Inspection elevator speed setting is too low.	1. Check the encoder wiring; 2. Remove the encoder interference; 3. Ensure the normal operation of the motor; 4. Inspection elevator speed setting is too low.
RF252	**While static angle tuning, motor speed is over proof**	During static angle tuning, after initial location, motor need to rotate for 3 rounds. During rotating, system give out speed but receive no feedback and the lasting time of this status has been over limit. Then system announce error.	1. Check if there is feedback from SIN/COS encoder; 2. Check the phase of power input.

Note:

1. Above description is for SIN/COS encoder;

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

6 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 below should be confirmed as well (parameters below are different with synchronous motor).

6.1 Motor Parameters Confirmation

Chart 6.1 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.

6.2 Encoder Parameters Confirmation

Chart 6.2 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.

6.3 PI Parameters Confirmation

Chart 6.3 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.

6.4 Elevator System Confirmation

Chart 6.4 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	0.50	s	Y	6-4

Chart 6.4 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	0.50	s	Y	6-4
F2-02	Insp Brake Time	Brake is not close at zero speed when stops at inspection running. Brake closes 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 /0.1~03 in sync control/async control.	0.00 ~ 9.99	0.05	s	Y	6-4

Chart 6.5 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.

7 Inspection Running

7.1 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.**

7.2 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.

8 Hoistway Parameter Learning

Chart 8.1 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.

8.1 Perform Hoistway Parameter Learning with Digital 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 down limit (down limit is valid);

4) Enter elevator hoistway self-learning menu through digital operator, follow the learning procedures shown below in Figure 8.1.

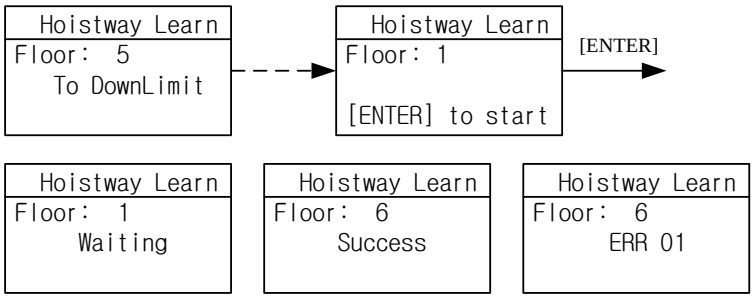


Figure 8.1 Hoistway Parameter Self-Learning Procedures

5) The results of learning can be seen from hoistway position parameter U0-00 to U0-69 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.

8.2 Perform Hoistway Parameter Learning with Digital Tubes & Operation Keys

Prefer to contents of Appendix VII.

8.3 Hoistway Parameter Learning Fault Diagnosis

Chart 8.1 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.
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.

Chart 8.1 Hoistway Parameter Learning Fault Diagnosis (Cont'd)

Error Code	Definition	Possible Solution
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 misses 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=24	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

9 Start-up comfort level adjustment

9.1 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% and 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:

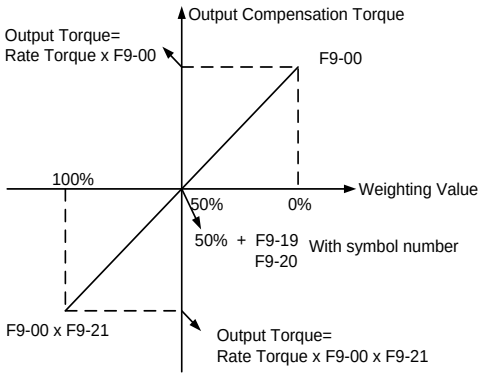


Figure 9.1 Good comfort level could be achieved with adjustment shown above

9.2 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.

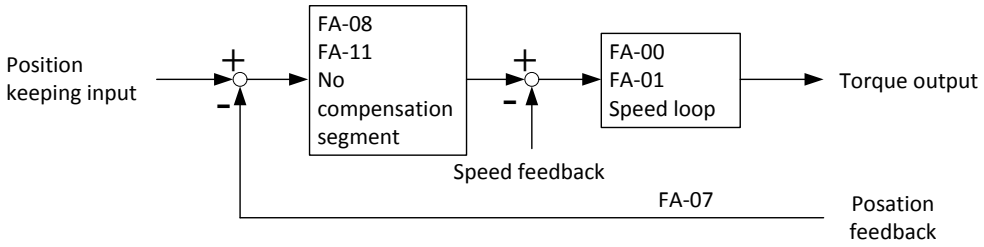


Figure 9.2 Flowchart for elevator starting without load compensation

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

Chart 9.1 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	3600	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 and FA-11: Two gain parameters for the starting without load compensation action, these two parameters can be adjusted according to the elevator slipping condition and comfort level, if the slipping is too much please increase the value of FA-08; if the traction machine gets vibration, please reduce this value; during the period of torque keeping, if there is slight slipping or small back-and-forth movement on traction sheave, please increase the value of FA-11, if there is vibration, please reduce this value.

(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 parameters in FA group 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).**

9.3 Elevator normal speed comfort level adjustment

Adjustments for Start/Brake Speed curve.

Elevator running speed curve is shown below.

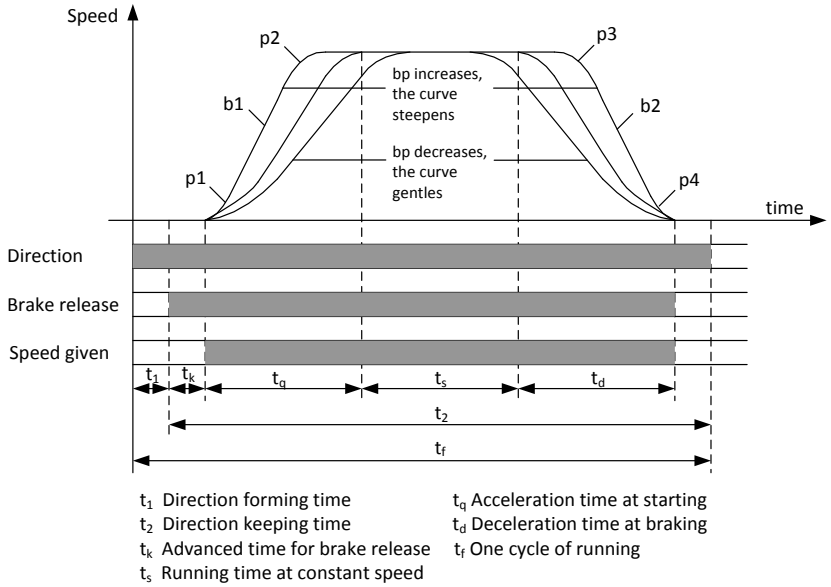


Figure 9.3 Elevator running speed curve graphic

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 9.2 Speed Loop PI Recommend Value

Type	Recommend Value
Proportional	700
Integral	260

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 is in instruction.

10 Leveling Precision Adjustment

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

10.1 Basic Conditions for Elevator Leveling

1) Make sure the leveling switches and leveling inductor plates are installed in the right position.

2) Leveling inductor plates' length on every floor must be same.

3) Leveling inductor plates must be installed vertically.

4) The position of leveling inductor plates should be precise. When elevator is at the leveling position, the center of the plate and center of two inductors should match together (refer to appendix III), otherwise elevator leveling will have deflection, which means in up or down running, elevator stops higher or lower than leveling position.

5) If magnetic inductors are adopted, please make sure the inductor plates inserting to the inductor sufficiently, otherwise it will influence the reaction time of inductor, in that way elevator will overruns the leveling position.

6) To ensure precise leveling, system require elevator to crawl for a certain distance before stop.

7) In practice, first make adjustment for a middle floor, until leveling is precise. Then, adjust the other floors on the base of these parameters.

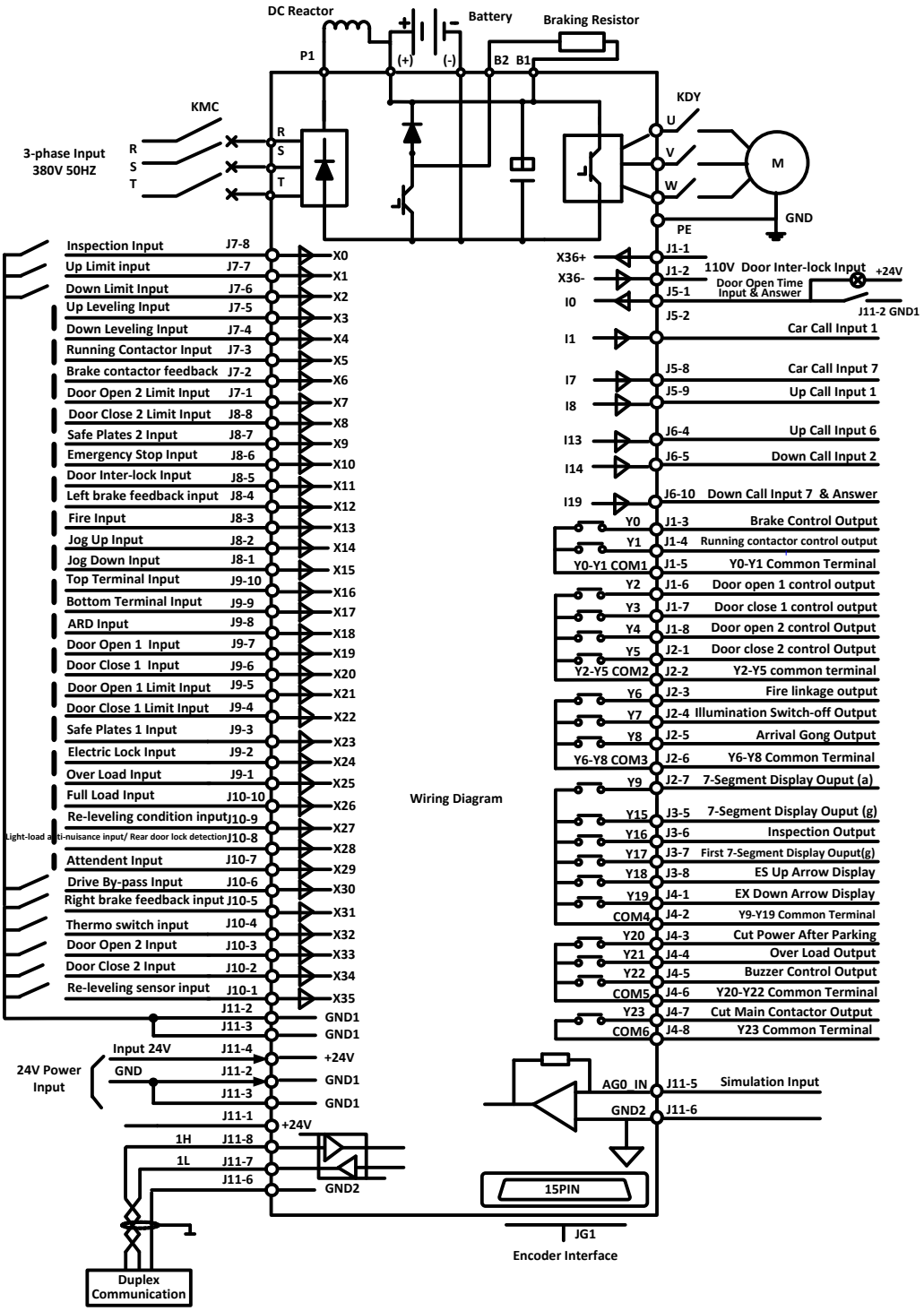
After adjusting curve selection, ratio and integral gain in the above context, please make sure every time elevator runs up or down, when stop at middle floor, its leveling positions are the same (or deflection ≤±2~3mm every time).

10.2 Leveling Parameter Adjustment

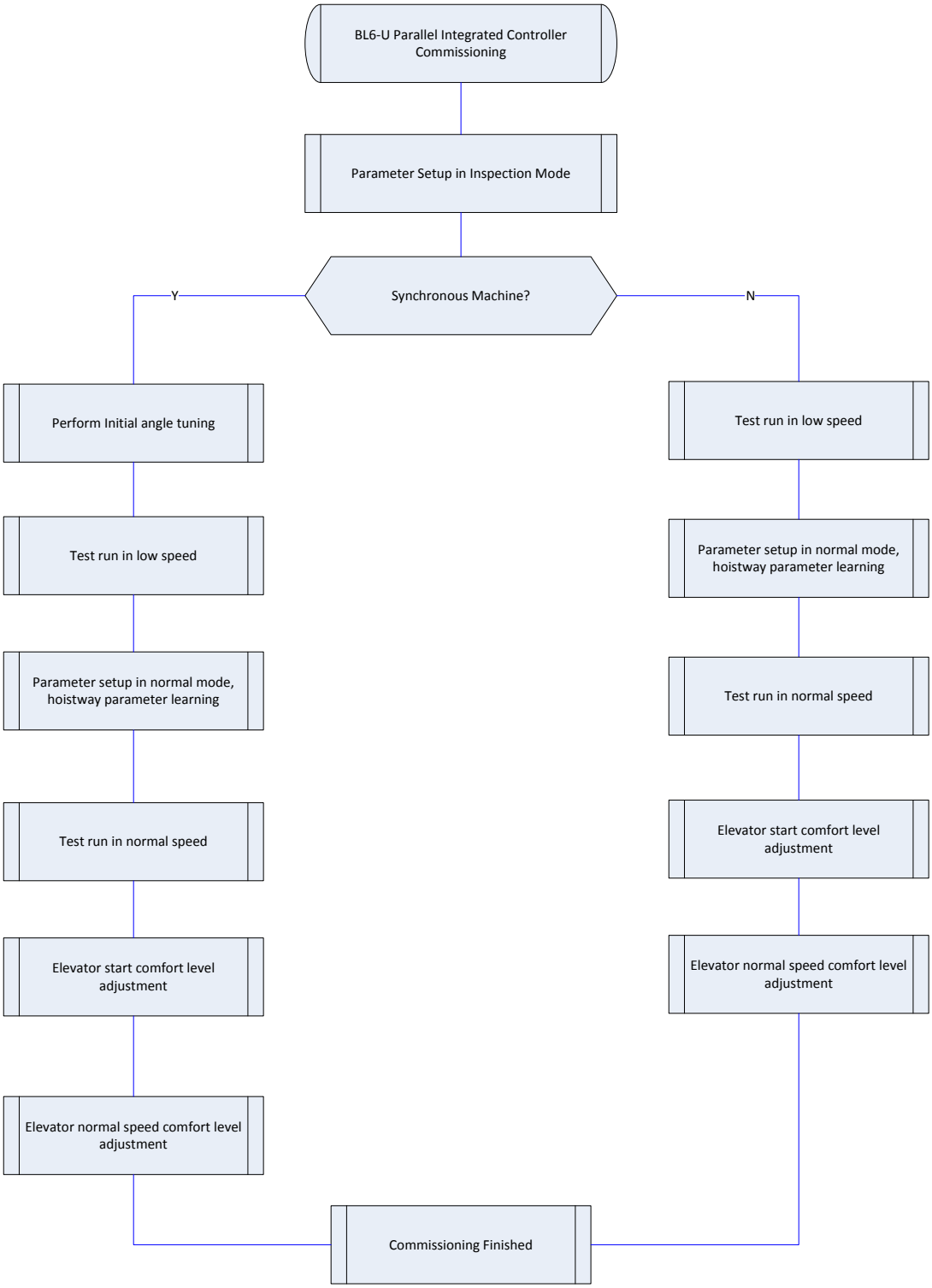
If elevator still cannot achieve desired leveling condition with adjustment based on instructions in section 1 of this chapter, further adjustments can be done by parameters. After elevator stops in normal running, if running speed curve has no problem (for example, no sudden stop or overrun beyond leveling 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).

<u>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.</u>

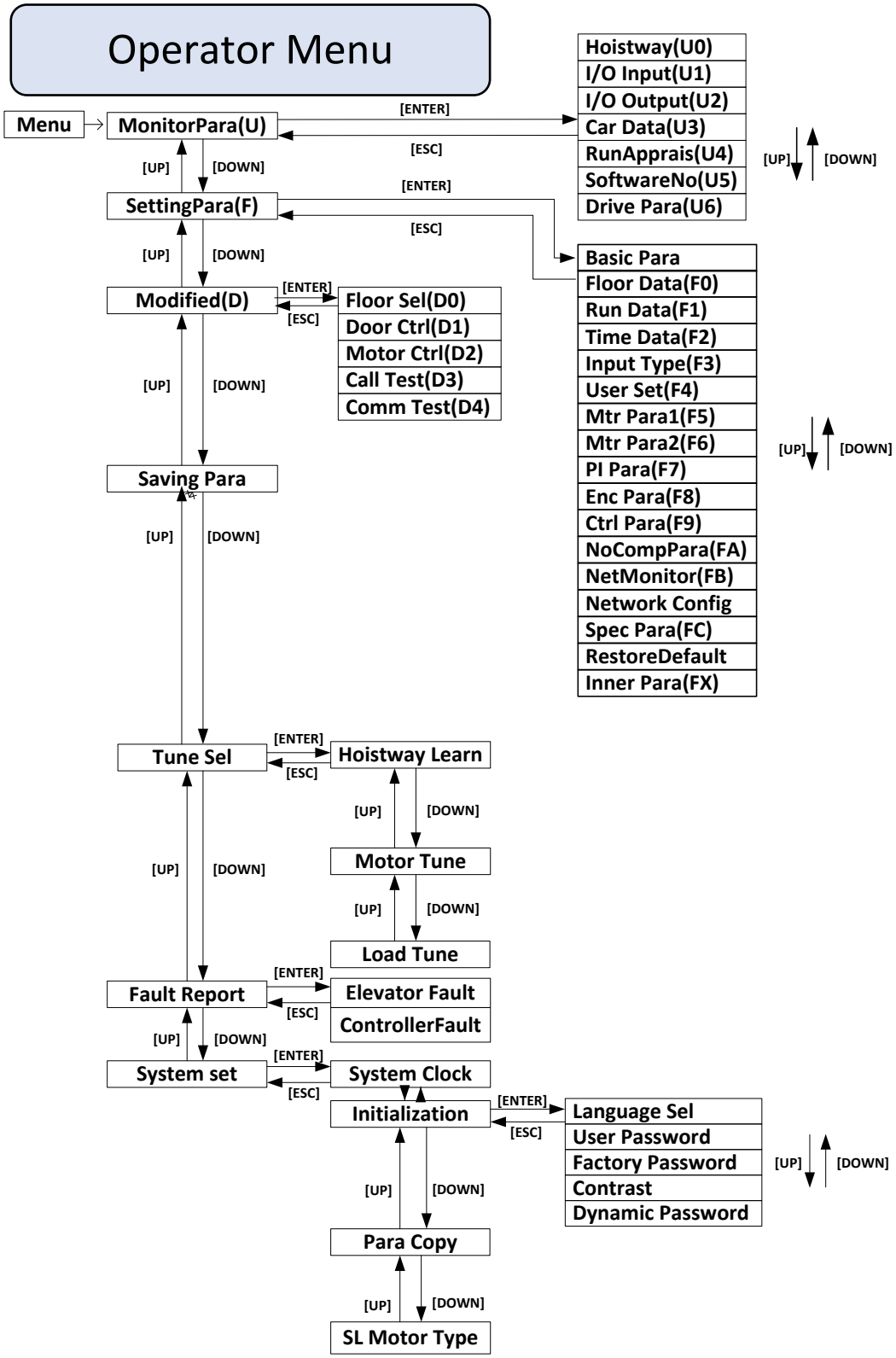
11 Integrated Controller Terminal Wiring Diagram



Appendix I BL6-U Parallel Integrated Controller Test Commissioning

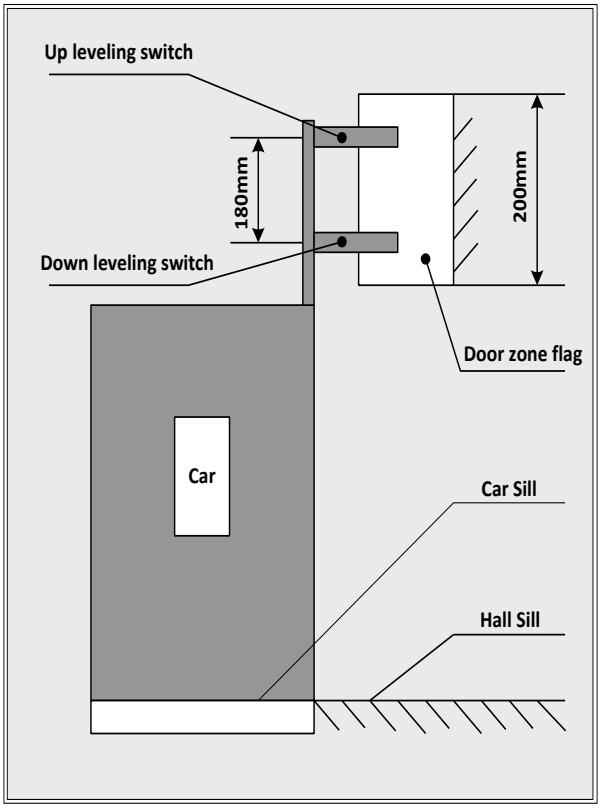


Appendix II BL6-U Parallel Integrated Controller Operator Menu



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 below. Leveling switches can be optical or magnetic.



Door zone flag & Leveling Switch Position

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 ΔS>0, flag on this floor should move down ΔS; move flag up ΔS, if ΔS<0.
3. Elevator need to redo the hoistway parameter learning after door zone flag adjustment.
4. Check elevator leveling on each floor, and redo part 1-3 if necessary.

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 … U0-69	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 correspond 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 comm 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.	--	--

U1~U5 Monitoring Parameters (Cont'd)

Para No.	Display	Content	Unit	Ref Page
U4-09	Lock Timer	The current elevator stop timer.	--	--
U4-10 … U4-19	Standby Para 1~Standby Para10	Reserve parameters. Some parameter can be given a meaning when needed.	--	--
U5-00	CtrlSoftWare NO	Show the elevator control software information. Provide the current software version for factory maintenance and software upgrading.	--	--
U5-01	DriveCodeVer	Show the drive control software information. Provide the current software version for factory maintenance and software upgrading.	--	--
U5-02	CpldEdition	Show base drive control software information. Provide the current software version for factory maintenance and software upgrading.	--	--

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
U6-21…U6-30	Standby Para 1 ~ Standby Para 10	Reserve parameters. Some parameter can be given a meaning when needed.	--

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	Show Select	Set the output display style: 1: 7-segment Code; 2: BCD Code; 3: Gray Code 4: Point-to-point; 5: Binary	1~5	1	--	N
F0-05 … F0-68	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	1.6	m/s	N
F1-01	Motor Speed	Motor speed at elevator rated speed (Calculated)	1~9999	306	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	0.03	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	0.5	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	0.5	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	0.5	m/s^3	N

Running Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
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	0.5	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	0.5	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	0.45	m/s^3	N
F1-16	Zero Speed	Motor speed less than set value, system considers elevator speed as zero and generates 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.	0~9	0	--	N
F1-22	Two Door Mode	Setup rear door mode, based on customer requirements, set from mode”0” to”5”.	0~5	0	--	N
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	0	--	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	0.5	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	0.5	s	Y
F2-02	Insp Brake Time	The time delay in inspection mode before brake close.	0.00~ 9.99	0.05	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	60	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
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	0.5	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

Time Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
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	3726441599	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	4294967295	N
F3-02	Input select 1	X12 Input Function Selection	0~32	12	N
F3-03	Input select 2	X18 Input Function Selection	0~32	18	N
F3-04	Input select 3	X27 Input Function Selection	0~32	27	N
F3-05	Input select 4	X35 Input Function Selection	0~32	35	N
F3-06	Input select 5	Spare	0~32	25	N
F3-07	output select 1	Spare	0~32	0	N
F3-08	output select 2	Spare	0~32	11	N
F3-09	output select 3	Spare	0~32	12	N

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	0 (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	0	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: While ER14 occurs, levels the car first to evacuate passengers on the nearest floor in the first place then return to base floor. OFF: Elevator directly returns to base floor.
F4-06-02	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.
F4-06-03	ON: Disable 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: Y16 means inspection output, when floor display is in 7-segment code mode (First 7-segment display must be not occupied).
F4-06-07	ON: Direction arrow flashes when the car is running.
F4-06-08	ON: When set floor display to 7-segment code mode, the floor display remains; OFF: When set floor display to 7-segment code mode, the floor display doesn't remain.
F4-06-09	ON: Elevator can cancel registered car call at running. If all call canceled, elevator stops in nearby floor.
F4-06-10	Only for internal test. Remain the default OFF state. ON: New curve is applied compulsively.
F4-06-11	ON: Arrival bell rings as soon as elevator enter landing zone （Time delay is still valid）. Floor number display changes after elevator enter landing zone; OFF: Arrival bell rings after a time delay when elevator arrive terminal floor. Floor number display changes after elevator change speed.
F4-06-12	ON: When elevator stops in inspection mode, brake will close after receiving zero speed signals to reduce impact.
F4-06-13	Spare
F4-06-14	ON: Enable landing/car call remapping; OFF: Disable landing/car call remapping.
F4-06-15	ON: Disable all display relays when elevator is in electric lock mode or emergency mode.
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 drops 0.5s later than brake close.
F4-06-18	ON: In rear door mode, elevator only installs one set of door open& close buttons; OFF: In rear door mode, elevator installs two sets of door open & close buttons.
F4-06-19	ON: Door close 1 and door close 2 will share the Y3 Output. Y5 is economy resistance; OFF: Y3 is door close 1, and Y5 is door close 2.
F4-06-20	ON: 3-phase 380V 50Hz power supply (with back-up generator); OFF: Battery power supply (disable BUS under voltage fault).
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: Simplex collective; OFF: Full collective. Default: OFF.
F4-06-23	ON: Use SJT-300 serial weighing device through CAN BUS; OFF: NO weighing device.
F4-06-24	ON: After brake arm feedback enable, turn on left (X12) and right (X31) double brake arm feedback; OFF: After brake arm feedback enable, only turn on the right (X31) brake arm feedback.
F4-06-25	ON: When the elevator cannot open door in current floor (OP fault in controller), it will automatically go to the next floor and open door.
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.
F4-06-27	ON: Redirection when zero speed has been detected. OFF: Redirection after brake close at zero speed.
F4-06-28	ON: Use light curtains/safety plates separately, the attendant up/down input terminal（X14/X15） 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	Spare

Special Function List (Cont'd)

Number	Instruction
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)
F4-06-31	Spare
F4-07-00	ON: When ARD function is active, system will open brake for 1s (when sliding speed >0.1m/s, brake will close again), it will then find the heavy load direction based on the sliding direction, use battery to land the cabin on heavy load direction and reduce leveling energy cost.
F4-07-01	ON: Enable elevator data recorder. Together with PC debugging software, after-sales/ service team can provide fault diagnosis。
F4-07-02	ON: open the releveling function; OFF: turn off the releveling function. (control software 1000_5600 and the above version support this function)
F4-07-03	ON: open the door-open-in-advance function; OFF: turn off the door-open-in-advance function. (control software 1000_5600 and the above version support this function)
F4-07-04	ON: open the door open waiting function for any floor. (control software 1000_5600 and the above version support this function)
F4-07-05	ON: enable the new national standard function; OFF: the old national standard scheme is enabled. (control software 1000_5600 and the above version support this function)
F4-07-06	Reserved.
F4-07-07	ON: If car speed inside leveling zone is still faster than rescue speed, then the car will be forced to stop in leveling zone.
F4-07-08	Reserved
F4-07-09	Reserved.
F4-07-10	Reserved.
F4-07-11	Reserved.
F4-07-12	ON: Enable clearing car calls when no light curtain actions within three car-call stops in auto running mode to anti trouble make.
F4-07-13	ON: Enable auto-restricting-door function to prevent door lock loop disconnect caused by no self-locking power.
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	Reserved.
F4-07-16	Reserved.
F4-07-17	ON: In UPS running mode, elevator will arrive in leveling zone, open the door, and close the Y23 contactor in 30s, then cut-off the UPS circuit to avoid UPS battery pack deep discharge.
F4-07-18	ON: The car waits at homing floor with door open.
F4-07-19	ON: Enable elevator run to bottom level in UPS running mode. (When applying this function, F4-07-00 and F4-07-25 will be no effect.)
F4-07-20	ON: Enable TIM Stop Floor function. Stop floor time set1 Start time: F2-18 & 19; End time: F2-20 & 21 TIM stop floor time set1 corresponds Set Stop Floor parameter is: F4-00 Set Stop Floor1, F4-01 Set Stop Floor2. Stop floor time set2 Start time: F2-14&15; End time: F2-16 & 17(multiplexing start time/stop time setting). TIM stop floor time set2 corresponds Set Stop Floor parameter is: F4-02 Set Stop Floor1, F4-03 Set Stop Floor2.
F4-07-21	ON: There is 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: enable hall door and call door short connection detection function; OFF: close this function. (control software 1000_5600 and the above version support this function)
F4-07-23	Reserved.
F4-07-24	ON: Elevator return to homing floor to proof reading level number when power on for the first time.
F4-07-25	Reserved.
F4-07-26	Reserved.

Special Function List (Cont'd)

Number	Instruction
F4-07-27	ON: Enable brake force self-test function. Automatically start at 3: 00AM or manually start by modify F4-07-30. （Default: ON） OFF: Disenable brake force self-test function. (control software 1000_5600 and the above version support this function)
F4-07-28	Reserved.
F4-07-29	ON: Leveling adjustment can be set separately. The default Leveling adjustment of each floor (1~64 floor) in setting parameters is 50mm.
F4-07-30	1. Every time turn to ON from OFF, act brake force self-test once. Keep ON will be ineffective; (1000_56xx) 2. open the door open waiting function for any floor. (1000_55xx)
F4-07-31	Reserved.

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	6.7	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		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	1.3	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	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	Hz	Y
F7-05	Kp1	PI available range 1 proportional gain	0~2000	700	--	Y
F7-06	Kx1	PI available range 1 integral gain	0~2000	260	--	Y
F7-07	Kp2	PI available range 2 proportional gain	0~2000	0	--	Y
F7-08	Kx2	PI available range 2 integral gain	0~2000	0	--	Y
F7-11	Kp3	PI available range 4 proportional gain	0~2000	700	--	Y
F7-12	Kx3	PI available range 4 integral gain	0~2000	260	--	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	0	--	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-08	PLKP1	No compensation effect proportional gain 1	1~6500	3600	--	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	KpIreg	Current ring proportional (FX-07), **MODIFY WITH CAUTION!**	0~65535	10000	N
FC -08	KxIreg	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

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	Brake open fault: System does not receive brake open feedback signal after output brake open command: 1. No X6/X31 feedback after Y0output 0.5/2s. 2. X6/X31 enable when Y0 has no output.	1. Check the traction machine brake detection switch and wiring; 2. If no feedback switch, should set feedback enable to **OFF**
Er6	During elevator running, leveling zone input signal X3, X4 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 Y1 output X5 no feedback in 0.4s. 2. X5 is enabled when Y1 has no output.	Check the contactor KDY coil and output/feedback circuit wiring.
Er10	Safety circuit open, input X10 is invalid.	Check all safety circuits.
Er11	Leveling switch signal missing: Elevator is running pass the floor, but there is not input at X3 /X4.	Check the leveling switches and its wiring.
Er12	Elevator pass top limit switch (X1 is invalid)	Check encoder, top limit switch including its position / wiring.
Er13	Elevator pass bottom limit switch (X2 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 (X3, X4) is invalid at elevator normal running.	Check leveling switches and wirings.

Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution
Er25	Heat sensor protection: Braking resistor or motor is over heat (X32 invalid).	Check heat sensor circuit. If this error cannot reset in 90s, Y23 relay on controller will output KMC contactor open signal.
Er26	Door inter-Lock fault: Door inter-Lock contactor working state does not match to its coil (X11, X36 input different)	Check door interlock contactor terminal & coil and their related terminal on controller.
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. (X16 or X17 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).	Check system ground condition; Eliminate interference. 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 Y2 for output signal; 2. If Y2 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.
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	Running contactor shakes in brake open action.	Check running contactor action and X5 running contactor feedback.
Er39	Brake force test failure, lack of brake force.	Examine the brake. Powering off can make it recover, however it should do a brake force test again to ensure enough brake force.
Er40	Brake is invalid and cause sliding error.	The safety protection function of safety circuit board has acted, the car has creeped and released people after finding brake invalid. Then the car return to top floor and try to brake again, but the brake is still invalid and the car slide. System latch the error unless power off.
Er41	Unexpected slide error examines brake force.	The safety protection function of safety circuit board has acted, the brake is successfully closed while car's creeping. System records the slide in fault record as a warning of brake force fault but shows no error.
Er42	While emergency running input is valid, the car moves unexpectedly because of the invalidation of brake force.	The car slide, the system report error and save fault record to avoid other unpredictable dangers. Because the voltage of emergency power may be too low while creeping.

Elevator System Fault List (Cont'd)

Error Code	Definition	Possible Solution
Er43	The safety protection function of safety circuit board has acted, the door circuit break because the car runs out door zone. System reports door zone missing error, this error will not recover until reset.	Because it will run out door zone, when door zone misses, and brake force become invalid in same time. It is for reminding maintenance staffs of solving door zone missing error in time, and avoiding the car runs out safety door zone while creeping.
Er44	The car meets unexpected sliding and during releasing passengers, the signal of top limit vibrates.	The sliding protection function of safety circuit board has acted. After the system finds brake invalid, the signal of top limit vibrates during upward creeping. Then the safety protection will be stopped by top limit error. This error will be latched and will not recover until reset.
Er45	The car meets unexpected sliding and during releasing passengers, the signal of bottom limit vibrates.	The sliding protection function of safety circuit board has acted. After the system finds brake invalid, the signal of bottom limit vibrates during downward creeping. Then the safety protection will be stopped by bottom limit error. This error will be latched and will not recover until reset.
Er46	The car meets unexpected sliding and during releasing passengers, the signal of top terminal vibrates.	The sliding protection function of safety circuit board has acted. After the system finds brake invalid, the signal of top terminal vibrates during upward creeping. Then the safety protection will be stopped by top terminal adhesion error. This error will be latched and will not recover until reset.
Er47	The car meets unexpected sliding and during releasing passengers, the signal of bottom terminal vibrates.	The sliding protection function of safety circuit board has acted. After the system finds brake invalid, the signal of bottom terminal vibrates during downward creeping. Then the safety protection will be stopped by bottom terminal adhesion error. This error will be latched and will not recover until reset.
Er48	Wrong parameters setting of unexpected sliding protection.	Enable sliding protection, but not enable door-open-in-advance and releveling function.
Er49	Signals of safety door zone miss.	Enable sliding protection but cannot detect safety door zone signals at door zone.
Er50	Unreasonable parameter setting.	Check the following setting: Check if parking floor, homing floor, fire floor is set to non-stop floor; Check if both front and rear door of stop-able floor are set to disable while in two door mode; Check if group control is enabled while parallel control or two door mode is enabled at same time.
Er51	Drive module overheat protection.	While running, the drive power module occurs overheat protection.
Er52	The signals of up and down door zone are reversed.	The signals of up and down door zone are reversed. Exchange wirings of up and down door zone signals.
Er53	Changing speed is too late, which after running through door zone.	Increase the minimum single layer velocity and curve acceleration.
Er62	Haven't used X31 as hall door detection, but X31 is effective. Or have no door contactor but X11 become effective.	1. Check if X31 is effective when F4-06-12 is OFF; 2. Check if X11 is effective when F4-06-13 is ON.
Er97	The minimum speed change distance is less than the door zone segment magnetic plate.	Increase the minimum running speed of single floor.
Er98	Drive program locked.	No unlock after program update. Please return to factory or contact with custom service.
Er99	Logic program locked.	No unlock after program update. Please return to factory or contact with custom service.

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)	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.	1. UV error after power ON; Check input power supply; Check input power cable terminals; Check cable between main board and power board; 2. Without load, up running is normal, but down running shows UV error, Check surge resistance; 3. UV error while ARD running, Check X18 connection; 4. UV error after power off. This is normal condition, system record each time of power off by UV error.
DF2	OV	**DC bus over voltage** (for 400V drive, 760V at OV protection; for 200V drive, 410V at UV protection)	1. Too short deceleration time; 2. Brake resistance value mismatch; 3. Supply voltage too high; 4. No connection to braking resistor or abnormal braking resistor or lack of capacity.	1. Increase deceleration time; 2. Connect capacity and connection of brake resistor; 3. Check power supply.
DF3	OH	**Heat sink overheated** Find temperature of module is higher than a preset value and keep for certain time; Find temperature of module is lower than zero degree and keep for certain time;	1. Excessively ambient temperature; 2. Damaged cooling fan; 3. Existence of heat source around; 4. Ambient temperature is below zero degree; 5. Bad connection between main board and power board.	1. Reduce ambient temperature; 2. Remove heat source around; 3. Check the fan and wiring; 4. Set FX-21 to OFF (disable minus temperature warning); 5. Check cable between main board and power board.
DF4	IF	**IPM fault** Find drive module has serious short circuit error, system trigger a hardware over-current protection. Please get rid of external short circuit before retrying	1. IPM over current/short circuit; 2. IPM over heat; 3. Abnormal IPM control power (UV); 4. Motor wire adhered or short to ground; 5. Abnormal star-sealed contactor action.	1. Check output short circuit; 2. Check motor short circuit; 3. Check star-sealed contactor action; 4. Contact with supplier.
DF5	OC	**Overcurrent** Phase current of controller has exceeded limit and keep for certain time	1. Inverter output short circuit; 2. Machine over-load; 3. Accel/decel time too short; 4. Encoder signals have a bad connection; 5. Wrong motor or encoder parameter setting: (1)Wrong original point (Gearless); (2)Rated slip is too large (Geared); (3)Wrong poles setting; (4)Wrong encode pulse setting; (5)Wrong P & I parameter setting.	1. Check motor short circuit; 2. Check accel/decel time, slow down if needed; 3. Check if inverter's capacity match load; 4. Check encoder connection: (1) Check original point (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.	1. Max speed /last time set incorrect; 2. Speed over-tuning; 3. Encoder feedback incorrect; 4. Wrong motor parameters setting.	1. Check speed limit setting; 2. Check the P/I parameter; 3. Check encoder; 4. Check motor parameters.
DF8	OE	**Speed over deviation** The speed deviation exceeds the allowable range(F9-03) and last longer than set time.	1. System overload; 2. Accel/decel time short; 3. Parameter setting wrong; 4. Encoder cannot work properly; 5. Brake wrongly act; 6. Wrong allowable range set.	1. reduce system load; 2. Increase accel/decel time; 3. Check the parameters; 4. Check the encoder; 5. Exchange motor phase sequence or exchange A+/A- and B+/B- wire; 6. Check brake action.
DF9	PGO	**PG disconnect** Did not receive encoder signal at operation. PG card type setting is different with actual one, system cannot identify it.	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.	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.	1. Wiring for baseblock at X14 is incorrect; 2. Setting electric level for baseblock at X14 is incorrect.	1. Check the wiring at X14; 2. Modify the parameters.
DF12	OL	**Motor overload** current output exceed 150% (200%) rated value for 60s (10s). Motor current exceed 150% (200%) rated value for 60s (10s).	1. System load too heavy; 2. System power rating too low; 3. Low capacity controller.	1. Reduce system load; 2. Change a more suitable controller; 3. Change motor or increase F5-08 rated current properly to promote overload capacity.
DF13	MC	**MC contactor bad action** Controller main contactor MC does not close after given close command for set time.	1. Wrong wiring for MC contactor; 2. MC contactor damaged; 3. Wrong FX-23 surge feedback type setting; 4. Drive power on power board is abnormal.	1. Try to reset the power, if this error come again, contact supplier for replacement; 2. Change FX-23 status, then power off and power on again.

DRIVER FAULT LIST (CONT'D)

Error Code	Dis play	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.	1. defective brake cable or damaged brake elements or IGBT module; 2. External brake resistor disconnected or not connected; 3. Bad connection between the main board and the power board.	1. Check brake resistor; 2. Replace the controller; 3. Check the main board and the power board connector.
DF15	OF	**Output phase lost** System find phase lost or break, running condition is not ready	1. Output cable break or loose terminal; 2. Motor stator cable disconnected.	1. Check output cable/terminal; 2. Check motor stator cable; 3. Set FD-21. BIT2 to 1 to disable this detection.
DF16	SCF	**Output current remains at elevator stop** After the system executes the stop instruction, the output current is not zero and the preset time is kept.	1. Controller damaged; 2. Cabinet works abnormally.	1. Change the controller; 2. Check cabinet wiring.
DF17	SRF	**Elevator slips after stop** After the system executes the stop command, the encoder's feedback speed is not zero.	1. Brake/encoder loose; 2. Encoder interference.	1. Fasten brake/encoder; 2. Remove interference source.
DF18	UF	Incremental: **Signal U of encoder wire lost** Sin/Cos: **Signal C and D abnormal**	1. Encoder damaged or wiring incorrect; 2. Wrong PG type setting.	1. Check encoder and wirings; 2. Correct PG type setting.
DF19	VF	Incremental: **Signal V of encoder lost** Sin/Cos: **A, B, C, D signals are highly similar**	1. Encoder damaged or wiring incorrect; 2. Wrong PG type setting.	1. Check encoder and wirings; 2. Correct PG type setting.
DF20	WF	Incremental: **Signal W of encoder wire lost** Sin/Cos: **Abnormal communication between SPG card and main board**	1. Encoder damaged or wiring incorrect; 2. Wrong PG type setting; 3. Bad connection between the main board and the PG card.	1. Check encoder and wirings; 2. Correct PG type setting; 3. Check whether the PG card is fastened to the main board.
DF21	DF	**Parameter setting error** System find rated current/no-load current/ rated slip/ poles/pulse setting error.	Parameter setting error Check rated current/no-load current/ rated slip/ poles/pulse setting.	Check parameter setting.
DF22	SDF	**Internal programmer self-check error** The system detected the types of faults that cannot be classified into routine fault types.	Internal data setting error.	Please contact with supplier.
DF23	150	**Current collection sensor error** When the elevator starts, the system detected that the instantaneous current value of the current sensor is not near the zero point.	1. Bad contact between main board and drive power; 2. Hardware error.	1. Please with contact supplier; 2. Check the main board and driver power board connection.

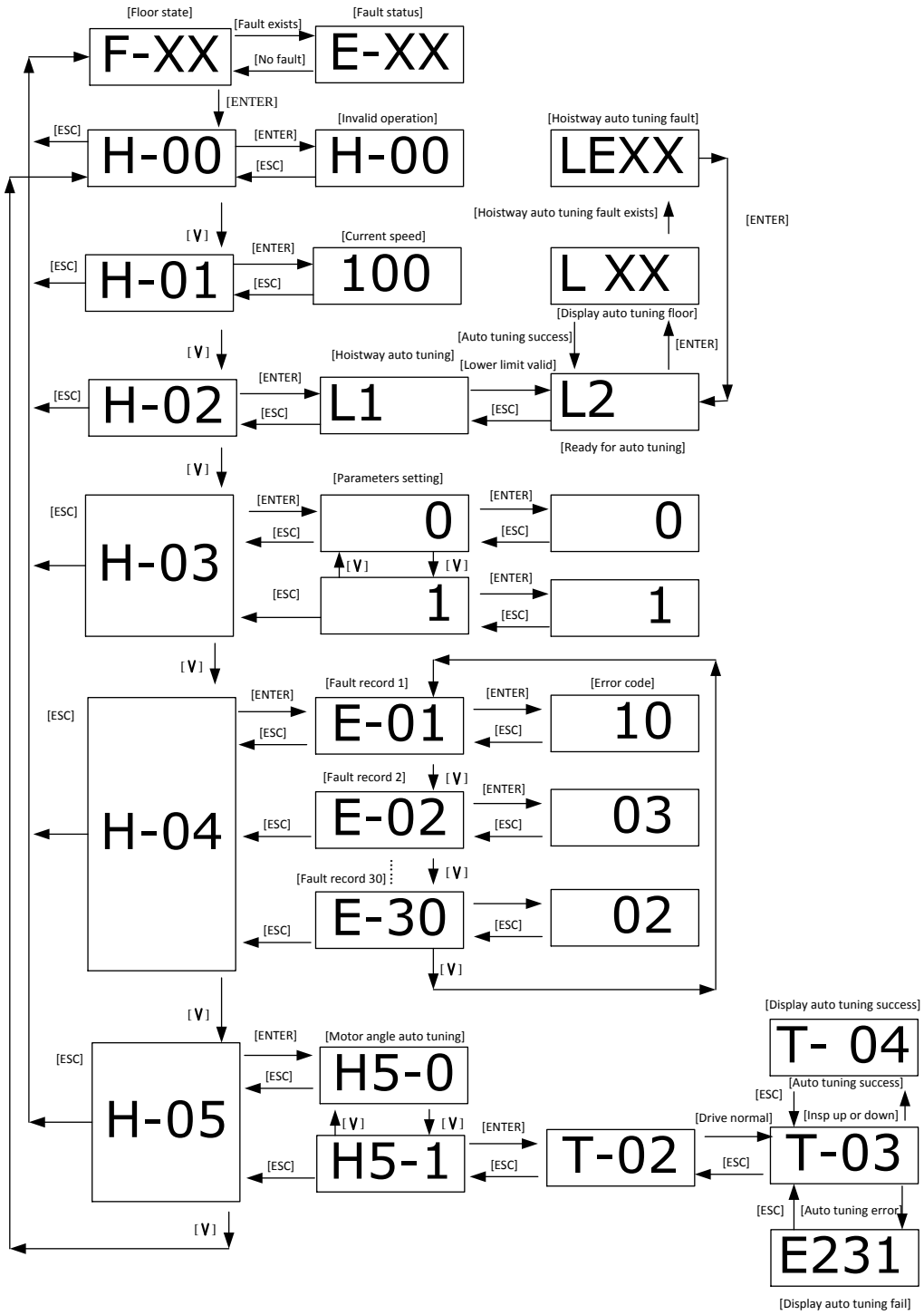
DRIVER FAULT LIST (CONT'D)

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

Appendix VII Menu operation processes with Digital tubes & operation keys



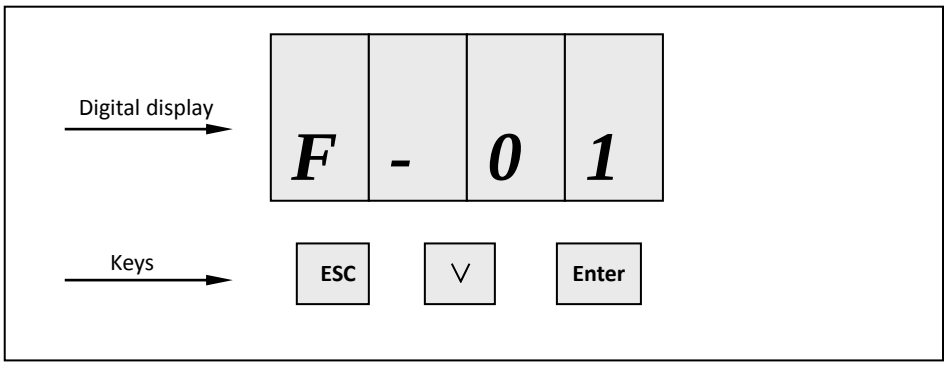


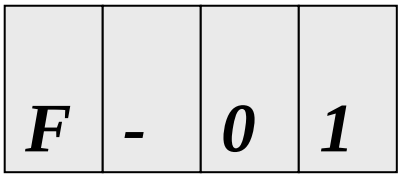
Figure Display and key layout

ESC: Cancel/return key;

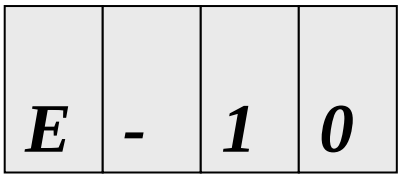
▽: Flip key;

ENTER: OK key;

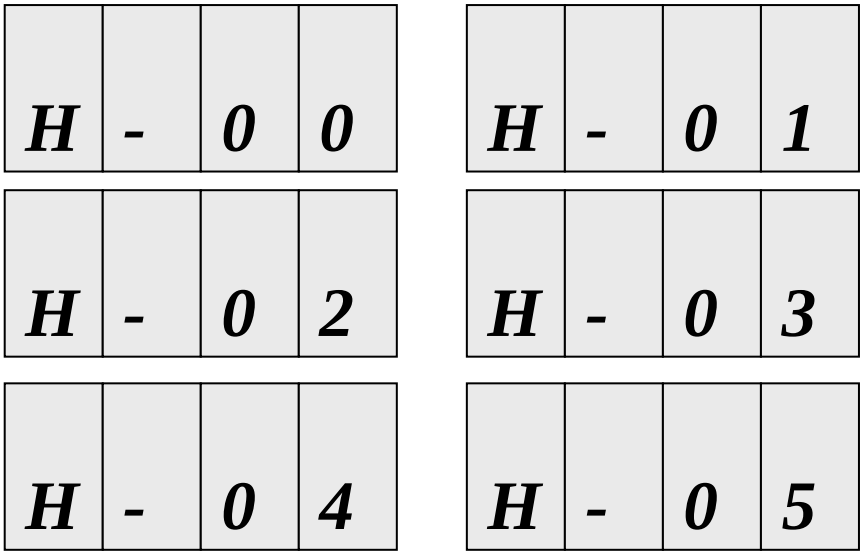
1. **Normally, display current floor F-XX:**



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

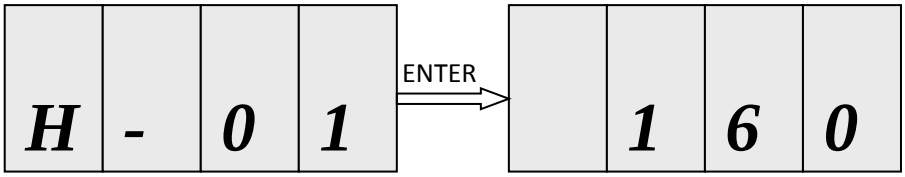


3. **Press ENTER key and Flip key to select H-00~H-04 parameters:**

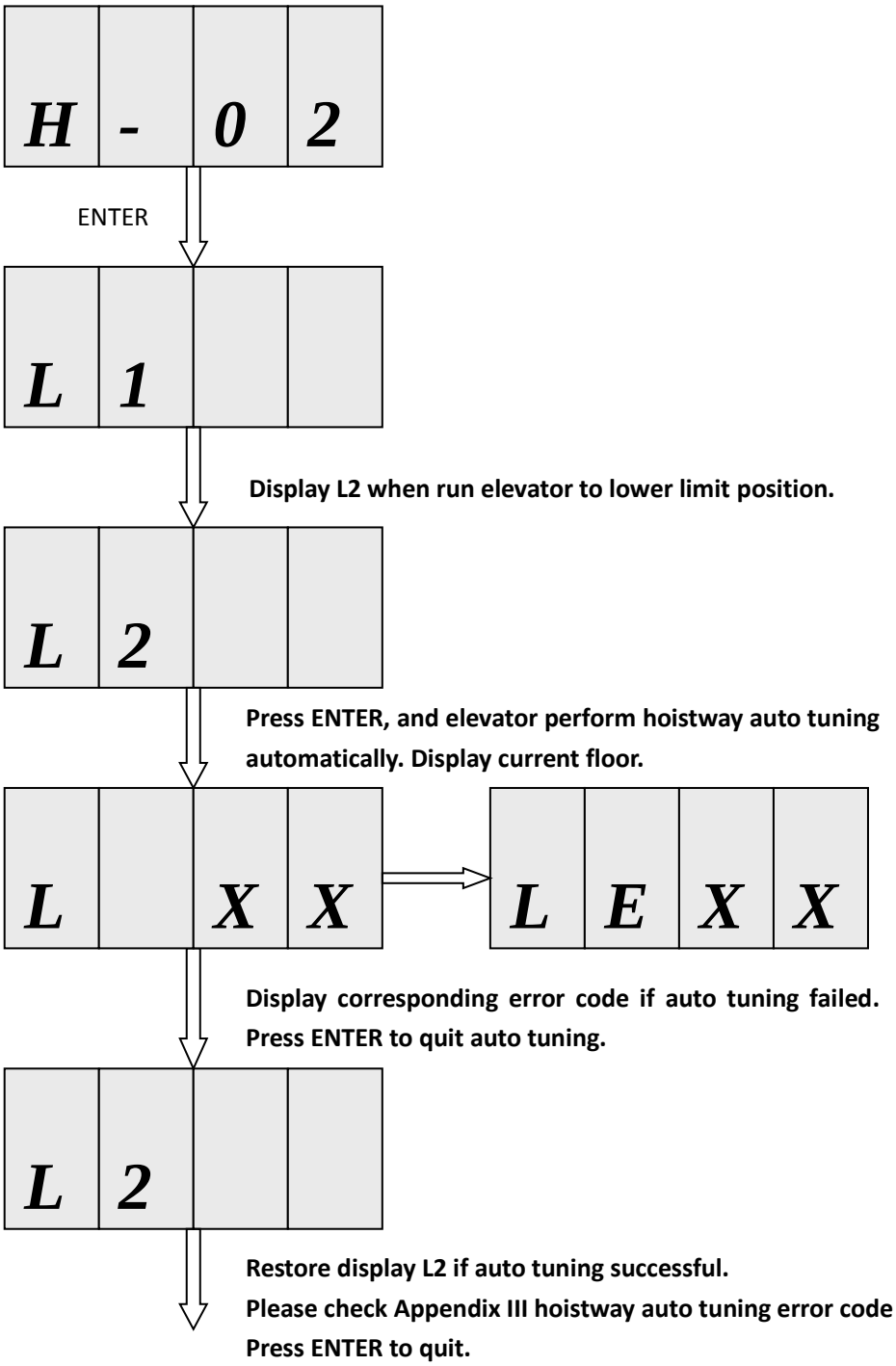


4. **H-00: Invalid parameter;**

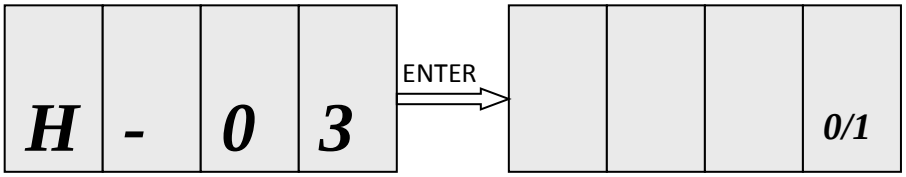
5. **H-01: Display current running speed (Unit: cm/s):**



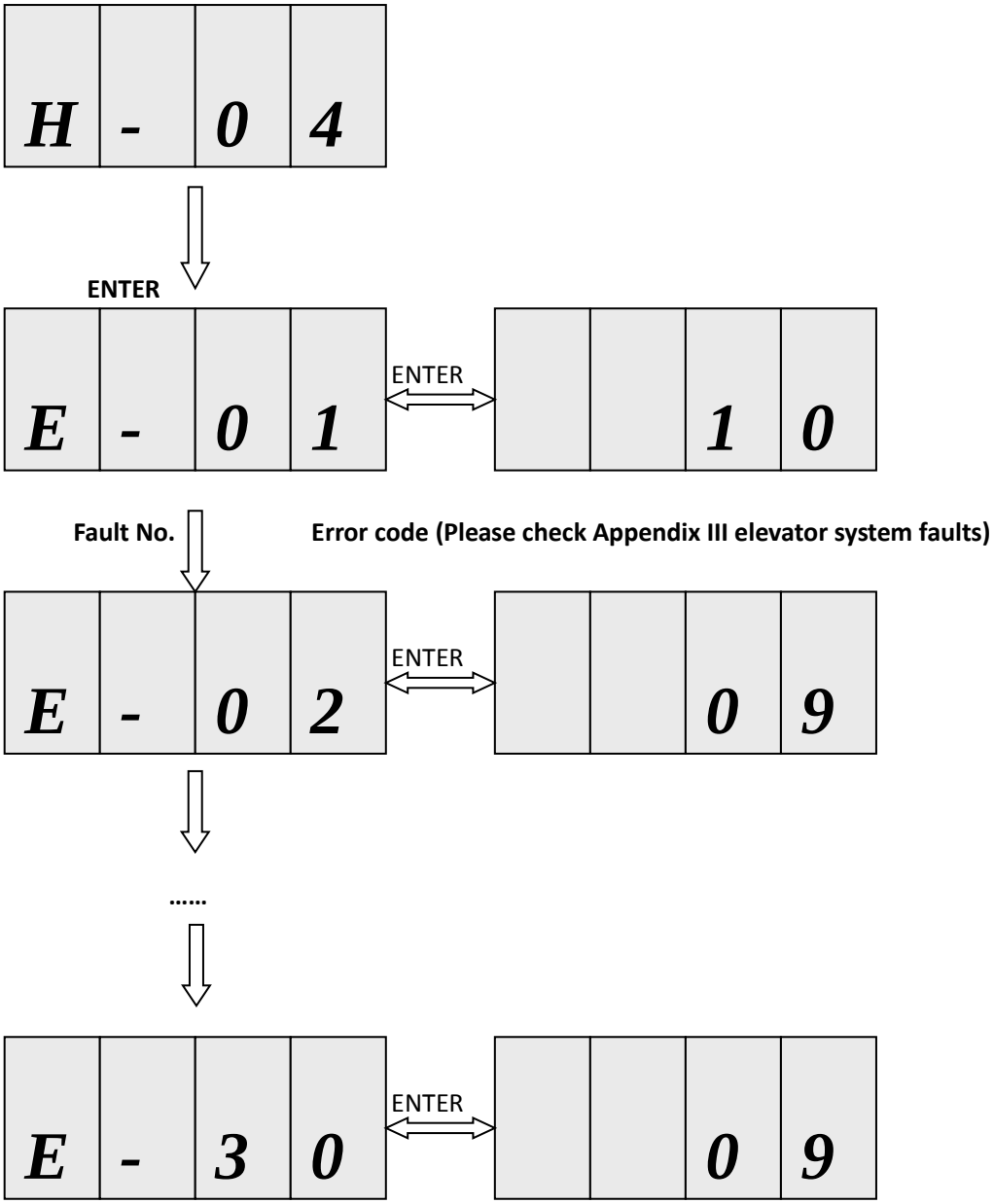
6. **H-02: Hoistway parameter self-learning:**



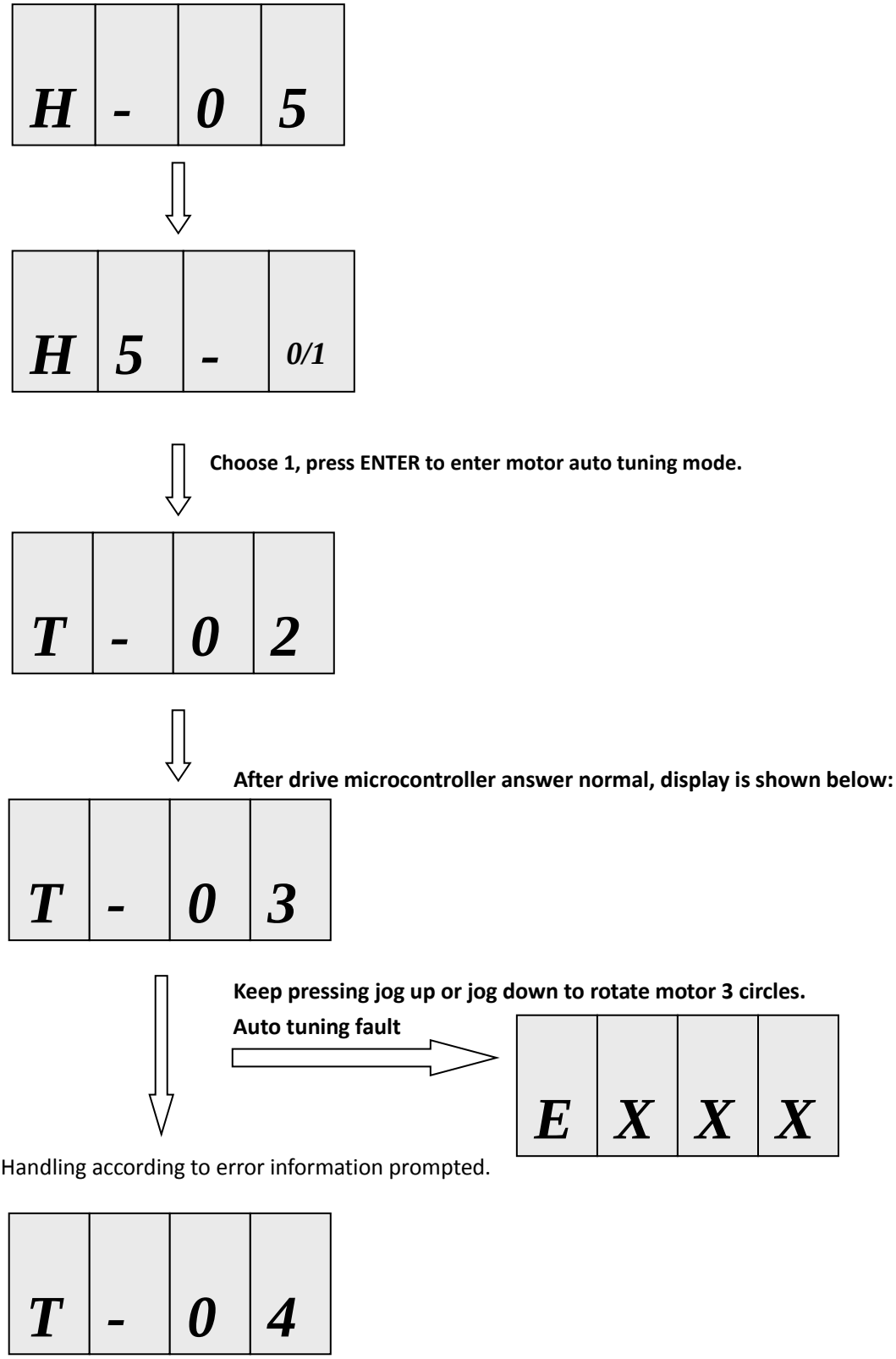
7. **H-03: Parameters setting with hand operator. Set once the parameter when connecting digital operator. (Set this parameter again to support hand operator after main board reset).**



8. **H-04: View 30 fault recodes.**



9. H-05: Motor static angle auto tuning



Auto tuning proceeds gradually.

Press ENTER to quit.