Integrated Controller

Quick Commissioning

User Manual
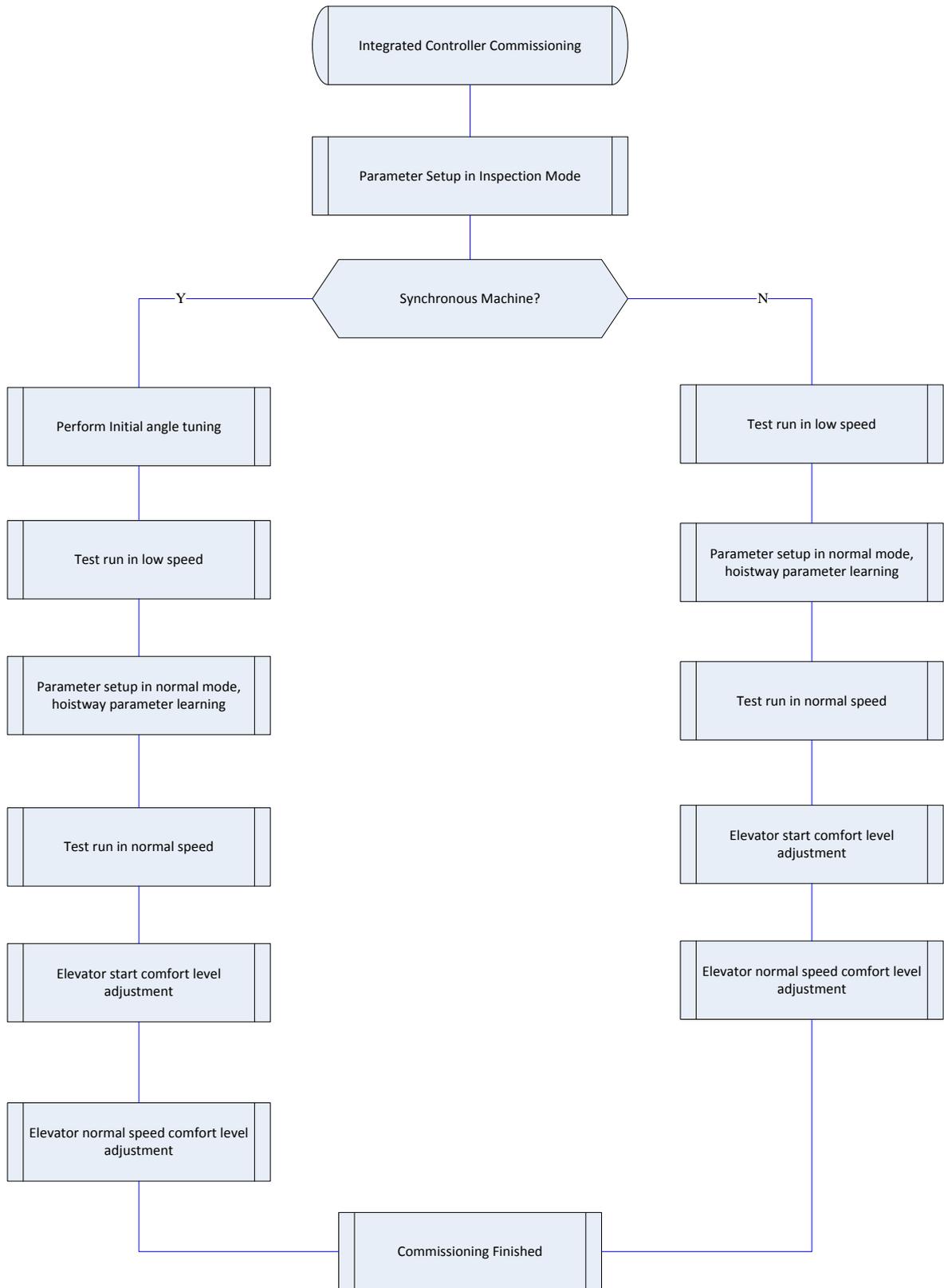
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1. Parameter Need to set before Inspection Run

Note: Parameters must be saved after setting operation; otherwise the original value will not be saved after power off.

Chart 1.1.1 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: Sin/Cos 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 for synchronous machine. normally set for 25%-40% of rated current.	
	F5-10	Rated Slip	Only for asynchronous machine; no need to set for synchronous machine. Setting according to actual situation. Calculation method: Rated Slip = rated frequency -(rated speed * poles/60). e.g.: The motor rated slip is 50-（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 ERN1387 encoder at no-weighing mode, set this to 0.	

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

Motor parameters automatically generated:

Enter the "BL Machine Input" interface as shown below from the main menu. Press [LEFT] or [RIGHT] key to move the cursor left or right cyclically. Press [UP] or [DOWN] key to set the content of the pointed area. The input content has three parts, separated by ".". The first part is the model number (separated in 4 digits), the middle part is encoder resolution information, the last part is the PG model. The detail information is showing below:
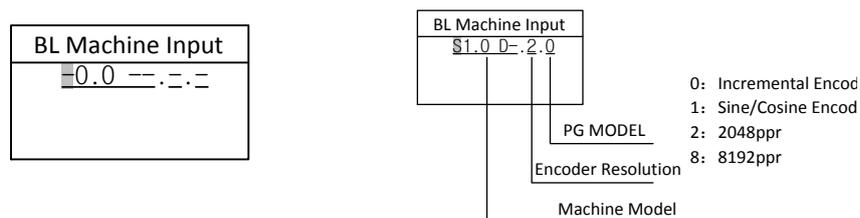
FIGURE 1.1.1 BL Machine Input Interface

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

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

Try again if interface indicates fail.

BL Machine Input		BL Machine Input		BL Machine Input		BL Machine Input
▇0.0 ──.─.─	[∧][∨] [<][>]	S1.0 D─.2.0	[ENTER]	S1.0 D─.2.0 writing	- - ▶	S1.0 D─.2.0 write successful

BL Machine Input		BL Machine Input		BL Machine Input		BL Machine Input
▇0.0 ──.─.─	[∧][∨] [<][>]	S1.0 DC.2.0	[ENTER]	S1.0 DC.2.0 Invalid model	- - ▶	S1.0 D─.2.0 write invalid
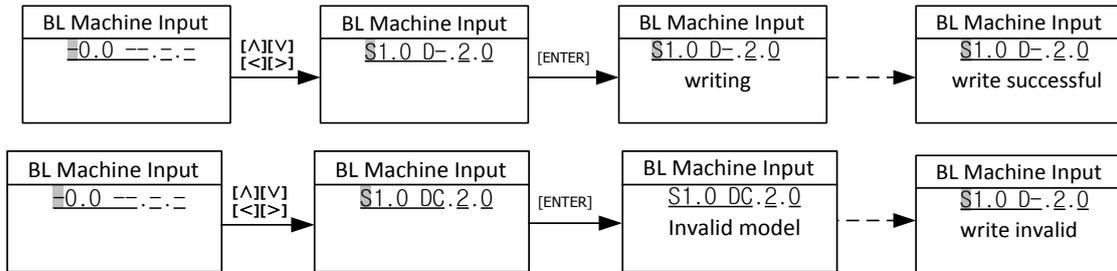
FIGURE 1.1.2 BL Machine Input Interface

2. Motor Initial Angle Tuning (Only for Synchronous Machine)

For machines without attached steel rope and no load, please follow section 2.1 "**Motor Initial Angle Tuning with no load**". For machines attached with steel rope and have load, please follow section 2.2 "**Motor Initial Angle Tuning with load**".

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

2.1 Motor Initial Angle Tuning without load

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

1) Ensure synchronous motor (traction machine) has no load (DO NOT attach steel ropes);
2) Connect running contactor output Y9 (J5-10) and COM3 (J5-6) to make it close (Modularized integrated machine terminals are D4-1 and D4-5);

   Note: if an independent star-sealed contactor is used, it is necessary to confirm that the contactor can be linked to the running contactor before Initial Angle Tuning, that is, when the running contactor works, the star-sealed contactor is also absorbed (not to seal the star); when the running contactor is disconnected, the star-sealed contactor has to be delayed (time delay enables the star-sealed).

3) Connect brake contactor output Y7 (J5-8) and COM3 (J5-6) to release the brake (Modularized integrated machine terminals are D4-3 and D4-5).

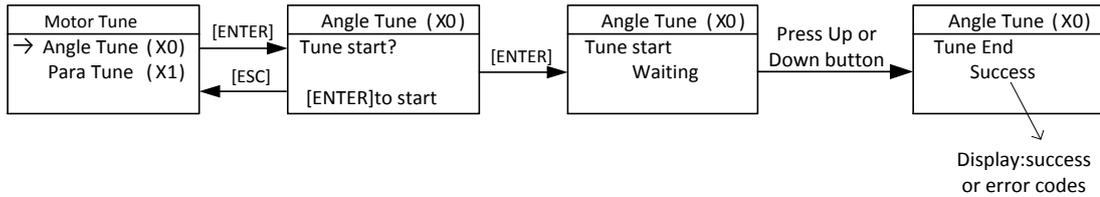Perform motor initial angle tuning with hand operator based on following procedures shown below:

| Motor Tune
→ Angle Tune（X0）
Para Tune（X1） | [ENTER]
[ESC] | Angle Tune（X0）
Tune start?

[ENTER]to start | [ENTER] | Angle Tune（X0）
Tune start
Waiting | Press Up or
Down button | Angle Tune（X0）
Tune End
Success |

Display:success
or error codes

FIGURE 1.2.1 Motor initial tuning without load (Do not attach steel ropes) sketch

Note: Rotation angle tuning no longer distinguish encoder type.

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

Chart 1.2.1 Motor Initial Angle Rotation Tuning Fault List

Error Code	Definition	Possible Causes	Possible Solution
RF100	**Controller fault** The drive has a failure and can not do Initial Angle Rotation Tuning.	Controller has met fault.	First solve fault according to error code, then angle tuning again. Refer to **Chart 4.1 Driver Fault List.**
RF226	**Give voltage limit** Already give limit force during angle tuning, but feedback current can not reach least requirement.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far less than the drive).	1. Check parameters of motor and encoder; 2. Decrease F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF227	**Output current over limit** During the tuning process, the driver controller detects that the output current has reached the limit and stops the output, indicating that the current is out of limit.	1. Incorrect parameters of motor or encoder; 2. The difference between the actual parameters of the motor and the estimated parameters of the driver is too large; 3. Power matching imbalance between motor and driver (The motor power is far more than the drive).	1. Check parameters of motor and encoder; 2. Increase F5-08 to complete tuning, then recover F5-08; 3. Check if the power of inverter is adapted to motor, refer 2.
RF228	**ESC input** During the tuning process, ESC input is effective, and self tuning is cancelled.	The hand operator triggers the ESC button to cancel angle tuning.	Angle tuning interruption, failure to complete, please do angle tuning again.
RF229	**Over time at zero speed** In the process of tuning, when the rotor is positioned, the feedback speed is not zero for a long time, and it can not locate accurately.	1. Motor carrying partial load; 2. Bad feedback speed of encoder.	1. Ensure brake is off; 2. Remove interference of encoder.

Chart 1.2.1 Motor Initial Angle Rotation Tuning Fault List (Cont'd)

Error Code	Definition	Possible Causes	Possible Solution
RF230	**Current abnormal detect** Feedback current is below the lower limit when tuning, so cannot continue.	1. Open circuit or lose phase in output load circuit. 2. Unbalanced motor three phases or rated current is wrong set. 3. Motor power and drive power are seriously mismatched (motor power is far less than drive power).	1. Confirm motor three phases are wired correctly. 2. Confirm motor parameters are correct set. 3. Confirm motor power and drive power are matched.
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 can not control the normal rotation of the motor.	1. Encoder connection fault, no feedback speed; 2. Motor has load or brake close; 3. The power difference between the motor and the driver is too large and does not match.	1. Check encoder A&B signal connection, elimination of encoder signal interference; 2. Make sure motor has no load & brake open; 3. Check the parameters of the number of the motor and the number of the encoder; 4. Detection of power matching of motor and driver controller, reduce the rated current [F5-08], and resume F5-08 after tuning.
RF233	**Motor rotates in wrong direction** In the process of tuning, the direction of the motor is not consistent with the control direction, and there is a reverse rotation.	Motor phase sequences does not match encoder.	1. Adjust motor phase sequence; 2. Adjust encoder A-, A+ or B-, B+.
RF234	**Encoder R pulse signal error** R pulse signal was not detected for a long time in the process of tuning.	1. No detection of R pulse signal; 2. Interference of encoder signal; 3. Error input of motor or encoder; 4. In the course of tuning, the motor is rotated in distress.	1. Check wiring for R pulse signal; 2. Elimination of encoder signal interference; 3. Verifying the number of motor poles and the number of encoder lines; 4. Open or close the brake in the process of self learning.

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.

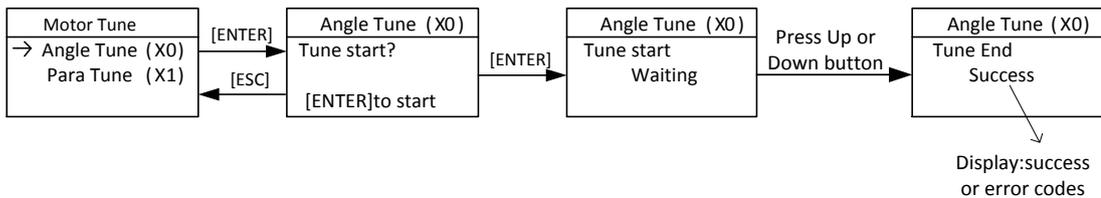## 2.2 Motor Initial Angle Tuning with load

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

1) Wiring in control cabinet is completely correct, and system under inspection mode;

2) Set running parameter(F1), motor parameter(F5), encoder parameter(F8) correctly;

3) All mechanical faults in hoistway are eliminated！

2.2.1 Motor Initial Angle Tuning with Hand Operator

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

FIGURE 1.2.2 Motor initial tuning with load (attach steel ropes) sketch

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

2.2.2 Please note the following items at Motor initial Angle tuning with load (attach steel ropes)

1) To ensure safety, during tuning process, people are not allowed to stay in car/hoistway！

2) Press up or down jogging button can base on the current cabin position;

3) The whole tuning procedures can be divided into two steps: static tuning and motor test run, make sure there is no gap between two steps. If no fault happens, before digital operator indicates success, press the jog up or down button constantly; (**Except fault or error exists！**);

4) If car running direction is opposite to inspection run button, correct this through F6-03.0: traction sheaves counterclockwise rotation & car run down;1: traction sheaves clockwise rotation & car run up (facing to traction sheaves). Set according to actual situation.

Chart 1.2.2 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 can not do tuning.	Controller has met fault	First solve fault according to error code, then angle tuning again. Refer to **Chart 4.1 Driver Fault List.**
RF226	**Give voltage limit** Already give limit force during angle tuning, but feedback current can not 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 1.2.2 Motor initial Angle tuning with load (attach steel ropes) error code (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.	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 4.1 Elevator System Faults List.**
RF229	**Over time at zero speed** Over time at zero speed Before start, feedback speed is not zero for a long time	1. Brake open or brake force is not enough; 2. There's interference in encoder.	1. Ensure brake is off; 2. Remove interference of encoder.
RF230	**Current detection error** During the tuning process, the feedback current value ultra lower limit and the self-tuning condition is not satisfied.	1. Broken circuit at load side or lack of phase; 2. Imbalance phase of motor side or rated current wrongly set; 3. Inverter cannot adapt to motor. (Motor capacity is highly lower than inverter)	1. Ensure 3-phase connection to motor; 2. Ensure motor parameters setting; 3. Ensure motor should adapt to inverter.
RF231	**CD signals of encoder is abnormal** In the process of tuning, it is found that CD feedback position value is abnormal, and it is impossible to identify the CD line sequence.	1. Parameters of motor or encoder have been wrongly input; 2. Interference in encoder; 3. Error input of motor or encoder; 4. Wrong PG type set.	1. Check CD signals wiring; 2. Remove interference; 3. Verify parameters of motor and encoder; 4. Check PG type set.
RF237	**Motor moved while static angle calculation** When the motor angle position is inferred static, the motor can not 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，Remove encoder interference; 2. Ensure the normal operation of the motor; 3. Inspection elevator speed setting is too low.

Chart 1.2.2 Motor initial Angle tuning with load (attach steel ropes) error code (Cont'd)

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.

3. Asynchronous Motor Adjustment

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

Chart 1.3.1 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.

Chart 1.3.2 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, 2048 or 8192. Specific modification according to actual situation.
F8-02	PG Type	PG card type (0: Incremental encoder, 1: Sine/Cosine encoder)	0/1	Select the corresponding PG card according to the actual output form of the encoder.

Chart 1.3.3 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.
FA-04	Zero Keep Kp	Proportional gain of zero speed keeping	0~2000	Default value is 1000. It is the zero-speed given status while starting. If sliding or shaking, you may adjust this parameter.
FA-05	Zero Keep KI	Integral gain of zero speed keeping.	0~10000	Default value is 600. It is the zero-speed given status while starting. If sliding or shaking, you may adjust this parameter.

Elevator System Confirmation:

Chart 1.3.4 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	1.00	s	Y	22

Chart 1.3.4 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. 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	1.00	s	Y	22
F2-02	Insp Brake Time	Brake is not close at zero speed when stops at inspection running. Brake close immediately with running speed exists after canceling jog up/down input. Keeping torque output time is too long in some 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	0.9	s	Y	22

Chart 1.3.5 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.

Note: Most of asynchronous motors use incremental encoder which works at 12V voltage. Push-pull output requires PG_V6X, and 5V encoder with differential output requires PG_V6.

4. Inspection Running

1. Things to check before inspection running

1) Safety circuit/door interlock circuit are normal, **DO NOT short door interlock**！

2) After power on, **KJT** emergency stop contactor in control cabinet, **KMB** door interlock contactor, **KMC power** contactor are closed, check if the controller is normal and parameter setting is correct, in LCD indicator, elevator state is **"INSP"**.

3) **Connect the brake to control cabinet properly.**

2. Inspection running

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

counterclockwise rotation & car run down;1: traction sheaves clockwise rotation & car run up. Set according to actual situation.

5. Hoistway Parameter Learning

Chart 1.5.1 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.

5.1 Perform Hoistway Parameter Learning with Hand Operator

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

Hoistway parameter self-learning procedure is as follows:

1. Make sure elevator meets the conditions for safety running！

2. Make sure all the switches in hoistway are installed and connected correctly, traveling

cable and hoistway cable are connected correctly, and finish setting the HOP/display

address;

3. Elevator in inspection mode, jog elevator down to the bottom limit (bottom limit is

valid);

4. Enter elevator hoistway self-learning menu through digital operator, follow the learning
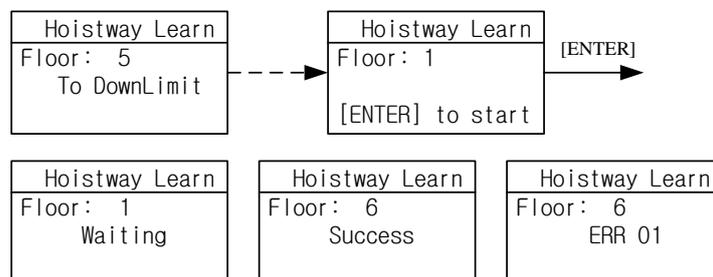
procedures shown below in Figure 1.5.

Figure 1.5.1 Hoistway Parameter Self-Learning Procedures

5. The results of learning can be seen from hoistway position parameter U00-U69 under

monitor menu with unit of meter, please check the switches position after hoistway

learning.

6. In self-learning process, if control system detects any abnormal phenomenon,

self-learning will be terminated and give fault code, please refer to troubleshooting table

in **chapter 3**, 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.

5.2   Hoistway Parameter Learning Fault Diagnosis

Chart 1.5.2 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 Chart 3.1 Elevator System Faults.
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 1.5.2 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 miss 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 (LER=25)	The up and down door zone signals are opposite in hoistway learning.	Check installation position of up and down door zone sensor, exchange their wires.

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

6. Start-up comfort level adjustment

6.1 Comfort level adjustment with weighing device

There are 3 weighing devices available for integrated controller: 1. 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) Without cabin 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.

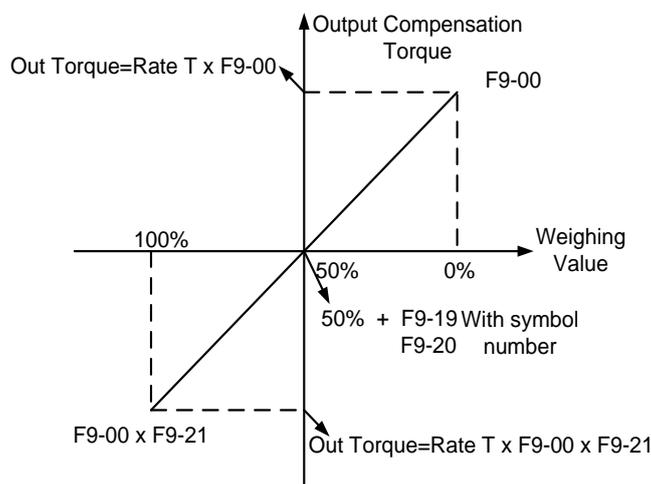The block diagram of weighing is shown below:

Figure 1.6.1 Good comfort level could be achieved with adjustment shown above

6.2 Start without Load Compensation Setup

### 6.2.1 No load compensation for Sin/Cos PG card

When using 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 Sin/Cos 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.
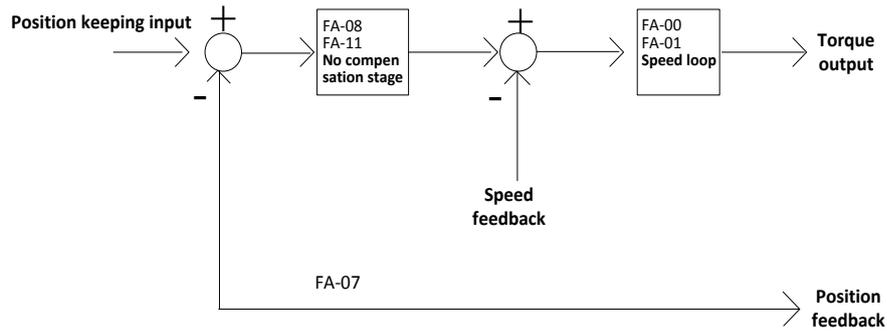
Figure 1.6.2 Flowchart for elevator starting without load compensation (Sin/Cos)

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

Chart 1.6.1 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	0	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 FA group parameters can be kept with factory setting.**

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

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

## 6.2.2 No load compensation for Incremental PG card

When using integrated controller with Incremental PG card, it is possible to achieve comfort start without load compensation by proper setup in F9 and 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 "0" (Incremental PG card【PG_V6 or PG_V6X】);
   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 Incremental 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.
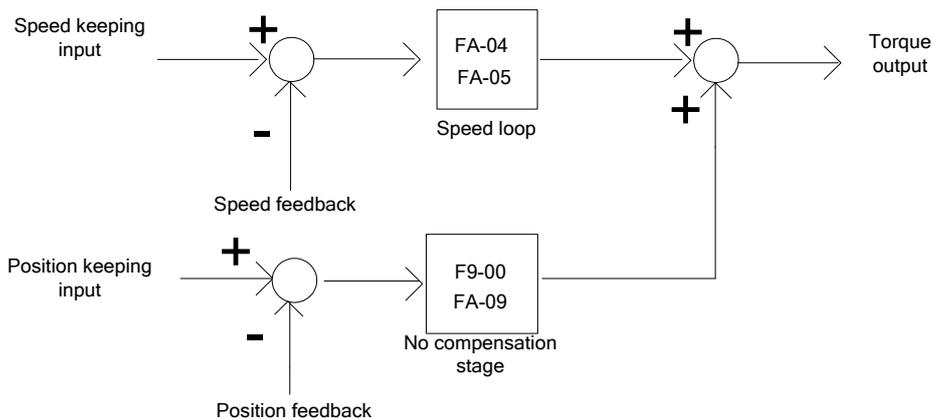
Figure 1.6.3 Flowchart for elevator starting without load compensation (Incremental)

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

Chart 1.6.2 Elevator start without load compensation parameters list

Parameters No.	Display	Factory Setting	Fast Brake Recommendation	Slow Brake Recommendation
FA -09	PLTime	900	700	Keep
F2-00	Brake ON Time	0.5	0.9	1
F9-00	Max Torq Comp	0	10~30	10~30
F9-11	Load Comp Enable	0	0	0
FA-04	ZeroKeepKP	1000	Keep	Keep
FA -05	ZeroKeepKI	600	Keep	Keep

   c) Adjustment method:
   Main parameters used are F9-00, FA-09, FA-04 and FA-05.

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.

F9-00: Run the elevator in inspection mode and check the traction wheel's sliding condition. The increase will inhibit the sliding car, and the larger adjustment will lead to excessive compensation, resulting in too much reverse sliding. Therefore, it is necessary to make appropriate adjustments according to the operation of the elevator.

FA-04 and FA-05: Speed loop PI parameters used during the non load compensation period.

6.3 Elevator normal speed comfort level adjustment

6.3.1 Adjustment for Start/Brake Speed curve
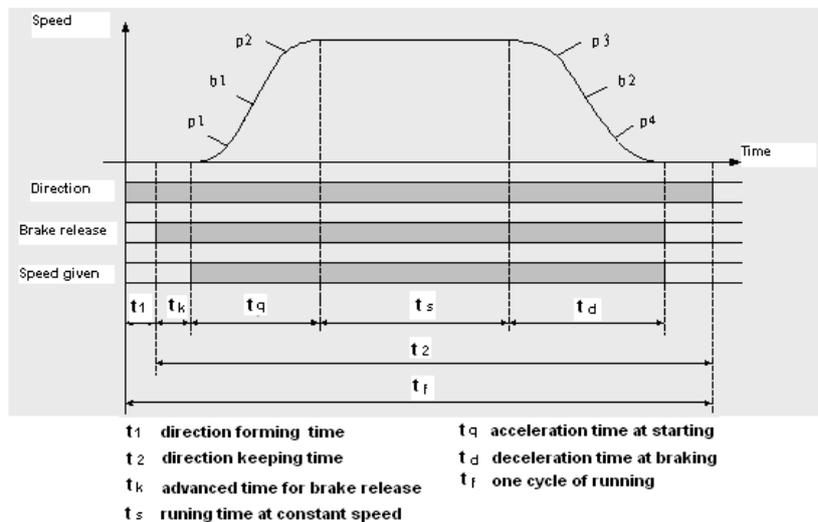
Elevator running speed curve is shown below.

t₁	direction forming time
t₂	direction keeping time
tk	advanced time for brake release
ts	runing time at constant speed
tq	acceleration time at starting
td	deceleration time at braking
tf	one cycle of running

Figure 1.6.4 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 1.6.3 Speed Loop PI Recommend Value

Type	Recommend Value
Proportional	1000
Integral	600

Speed loop proportional/integral can be adjusted by 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 is described in specific section of instruction.

6.3.2 Leveling Precision Adjustment

1) Basic Conditions for Elevator Leveling

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

2. Length of leveling inductor plates on every floor must be the same.

3. Leveling inductor plates must be installed vertically.

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

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

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

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

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

2) Leveling Parameter Adjustment

If elevator still cannot achieve desired leveling condition with adjustment, 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).

Chapter 2 Parameters

1. Monitoring Parameters

Chart 2.1.1 U0 Monitoring Parameters

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

Chart 2.1.2 U1～U5 Monitoring Parameters

Para No.	Display	Content	Unit	Ref Page
U1-00	Input Data	Controller input data show in decimal type. It will be turned into binary type to show the logical status of the input port.	--	--
U1-01	Input Bin	Input port data show in binary type. Each data corresponds to logical status of one input port.	--	--
U1-02	Input App	Each line corresponds to one input port," On/Off" states the current port status, the following "n" value states the signal appraisal to input level. Value from "10" to "0" refers to interference condition from good (less interference) to bad (large interference)	--	--
U2-00	Output Data	Display the output port Y0-Y15 current status. The valid output port has the corresponded indication. Port without output (invalid) will be hidden.	--	--
U3-00	Car Input Data	Display car input signal status. The valid input port has the corresponded indication. Port without input (invalid) will be hidden.	--	--
U4-00	Run Times	Show the elevator accumulated running times. Adopts 10 digital decimal figures as indication	Times	--
U4-01	Run Hours	Show the elevator accumulated running hour. Adopts 10 digital decimal figures as indication.	Hour	--
U4-04	SendApp1	Signal send appraisal for Duplex and group control. Large number means com send more mistakes.	--	--
U4-05	ReceiveApp2	Signal receive appraisal for Duplex and group control. Large number means communication receive more mistakes.	--	--
U4-06	Interfer Apprais	Appraise the value of interference strength at site. The big value refers to strong interference,"0" states no interference and good GND condition.	--	--
U4-07	Encoder Apprais	The interference degree of encoder signal. When elevator runs steady, large value states the encoder signal weak with heavy interference.	--	--
U4-09	Lock Timer	The current elevator stop timer	--	--
U5-00	CtrlSoftWare NO	Show the elevator control software information. Provide the current software version for factory maintenance and software upgrading.	--	--

Chart 2.1.2 U1～U5 Monitoring Parameters (Cont'd)

Para No.	Display	Content	Unit	Ref Page
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.	--	--

Chart 2.1.3 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
C19	ZHS	J5-2	Attendance direction up
C20	ZHX	J5-3	Attendance direction down
C21	LSB1	J2-5	New light curtain 1 input
C22	LSB2	J2-9	New light curtain 2 input
C23	--	J1-14	Modular car top board communication Up door zone
C24	--	J1-12	Modular car top board communication Down door zone
C25	--	J1-13	Car top communication Up door zone
C26	--	J1-16	Car top communication Down door zone

Chart 2.1.4 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	℃
U6-07	Output Torque	Output Torque	N·M

2. Setup Parameters

Chart 2.2.1 Building Setup Parameters List

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

Chart 2.2.2 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	1450	RPM	N
F1-03	Insp Speed	Car running speed at inspection cannot exceed 0.6m/s based on relevant standards and regulations	0~0.6	0.3	m/s	Y
F1-04	Start Speed	For large resistance at motor start, the starting speed can have smooth increase. The start smooth speed is invalid if set to "0".	0~0.2	0.00	m/s	Y
F1-05	Leveling Speed	When elevator park outside door zone due to fault, if satisfy running condition, the elevator can level to door zone with this speed.	0.01 ~ 0.3	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	0.7	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	0.7	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	0.6	m/s^3	N

Chart 2.2.2 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	0.6	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	0.6	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	0.6	m/s^3	N
F1-16	Zero Speed	Motor speed less than set value, system considers elevator speed as zero and output brake signal.	0~10	1	RPM	Y
F1-17	Leveling Adj	Adjust differences of up/down leveling	0~100	50	mm	N
F1-18	Load Adj	Normally used in synchronous machine system, compensate elevator load based on steel rope weight difference on each floor.	0~20	0	--	Y
F1-21	Drive Mode	Selection of driving mode, when setting "1", attendant/VIP mode close door manually; when setting "3", elevator automatically do test run, other value is invalid. When setting "4", enter the UCMP test mode; when setting "5" temporary shielding limit fault, run to up/bottom limit switch in inspection mode.	0~9	0	--	N
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

Chart 2.2.3 Time Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Change
F2-00	Brake ON Time	Brake open first then run elevator speed curve. This is to improve the elevator start comfort and match control system with different machine brake on time.	0.00~9.99	0.50	s	Y
F2-01	Brake OFF Time	Brake close first then disable elevator run. This is to improve elevator stop comfort and avoid slip at elevator stop.	0.00~9.99	0.50	s	Y
F2-02	Insp Brake Time	The time delay in inspection mode before brake closes.	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	0.30	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	3	s	Y
F2-06	Open Delay Time	Enable door open delay function, press open delay button, door open time will be delayed.	0~999	30	s	Y
F2-07	Homing Time	The waiting time before elevator return to homing floor without landing/car call, set value to "0" to disable this function.	0~999	60	s	Y
F2-08	Door Run Time	1. The door open/close command run time; 2. Door open/close relay run time for door drive without open/close limit switch. 3. For door drive with open/close limit switch, this run time should be 1s longer than the door actual open/close time.	0~999	5	s	Y
F2-09	Beep Delay Time	After elevator change speed to target floor, landing signal is delayed by set time, arrival gong /voice synthesizers are also delayed by set time.	0.00~9.99	0.15	s	Y
F2-10	Enable Delay	Drive enable signal given/drop is delayed by set time after drive direction signal is given/drop. During this time, drive output current is decreased to reduce current noise.	0.00~9.99	0	s	Y
F2-11	Lamp Off Time	In Auto mode, if have no car/landing call during set time, system will cut car light power from COP.	0~999	15	min	Y
F2-12	Over Time	To prevent wire rope slipping or elevator car stuck, time from elevator running to stop is limited to set value. If elevator is running longer than set value, system stops immediately and enter protection mode. Need to re-start the system in order to exit from such mode.	0~999	45	s	Y
F2-13	SmoothStart Time	The time to keep elevator start smooth.	0.00~9.99	0	s	Y
F2-14 F2-15	Start Time	System will automatically start the elevator (Electric lock: ON) at set time.	00:00 23:59	00:00	h: min	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	h: min	Y
F2-18 F2-19	Start Time1	System will automatically start the elevator (Electric lock: ON) at set time.	00:00 23:59	00:00	h: min	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	h: min	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.

Chart 2.2.4 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	3974102631	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	4294573839	N
F3-02	Input select 1	X19 Input Function Selection	0~32	19	N
F3-03	Input select 2	X22 Input Function Selection	0~32	22	N
F3-04	Input select 3	X23 Input Function Selection	0~32	23	N
F3-05	Input select 4	X24 Input Function Selection	0~32	24	N
F3-06	Input select 5	X25 Input Function Selection	0~32	25	N
F3-07	output select 1	Y0 Output Function Selection	0~32	0	N
F3-08	output select 2	Y11 Output Function Selection <table><tr><td>F3-08</td><td>content</td></tr><tr><td>0-11</td><td>Instead of Y0 - Y11 output.</td></tr><tr><td>12</td><td>Thermistor overheat protection output.</td></tr><tr><td>15</td><td>Alarm closure output (when elevator is running or in door zone with door open, disable the alarm).</td></tr><tr><td>16</td><td>Integrated controller fault indication output.</td></tr><tr><td>17</td><td>UPS shut down the emergency door and cut off the UPS power after 30 seconds.</td></tr><tr><td>18</td><td>Car accident mobile detection, Y11 output trigger rope clamp.</td></tr><tr><td>19</td><td>The output is not valid when it is in automatic, and the output will be prompted under the mode of inspection, fire fighting, driver and special-use.</td></tr><tr><td>20</td><td>When the elevator goes up, the signal is output for foreground optoelectronic rope head weighing.</td></tr><tr><td>21</td><td>Emergency output, when X18 outage emergency is valid or peripheral +24V power is invalid.</td></tr><tr><td>22</td><td>Brake resistor fan control output, it outputs to cool down the resistor.</td></tr><tr><td>23</td><td>Retiring cam output for retiring cam with normal state of drawing back.</td></tr></table>	0~32	11	N

Chart 2.2.4 Input Type Setup Parameters List (Cont'd)

Para No.	Display	Content	Range	Def Value	Live Change
F3-09	output select 3	Y10 Output Function Selection 	F3-09	content
---	---
0-11	Instead of Y0-Y11 output.
12	Thermistor overheat protection output.
15	Alarm closure output (when elevator is running or in door zone with door open, disable the alarm).
16	Integrated controller fault indication output.
17	UPS shut down the emergency door and cut off the UPS power after 30 seconds.
18	Car accident mobile detection, Y10 output trigger rope clamp.
19	The output is not valid when it is in automatic, and the output will be prompted under the mode of inspection, firefighting, driver and special-use.
20	When the elevator goes up, the signal is output for foreground optoelectronic rope head weighing.
21	Emergency output, when X18 outage emergency is valid or peripheral +24V power is invalid.
22	Brake resistor fan control output, it outputs to cool down the resistor.
23	Retiring cam output for retiring cam with normal state of drawing back.		0~32	12	N

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

Chart 2.2.5 Service Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Live Change
F4-00	Set Stop Floor1	Set elevator stop/bypass at floor corresponds to each bit. (1-32 floors)	0~4294967295	4294967295	Y
F4-01	Set Stop Floor2	Set elevator stop/bypass at floor corresponds to each bit. (33-64floors)	0~4294967295	4294967295	Y
F4-02	TIM Stop Floor1	Set elevator stop/bypass at floor corresponds to each bit at the set time. (1-32 floors)	0~4294967295	0	Y
F4-03	TIM Stop Floor2	Set elevator stop/bypass at floor corresponds to each bit at the set time. (33-64 floor)	0~4294967295	0	Y
F4-04	Door Select A1	Set elevator front door enable /disable at floor corresponds to each bit (ON/OFF: Front door enable /disable at this floor)	0~4294967295	4294967295(1~32 levels)	Y
F4-05	Door Select B1	Set elevator rear door enable /disable at floor corresponds to each bit (ON/OFF: Rear door enable /disable at this floor)	0~4294967295	4294967295(1~32 levels)	Y
F4-06	Function Select	Set elevator functions enable /disable at floor corresponds to each bit. (ON: Enable, OFF: Disable)	0~4294967295	4	Y
F4-07	Function Select 2	Set elevator functions enable /disable at floor corresponds to each bit. (ON: Enable, OFF: Disable)	0~4294967295	0	Y

Chart 2.2.6 SPECIAL FUNCTION LIST

Number	Instruction
F4-06-00	After elevator stops, based on current floor, if there is no landing/car call ahead of the current floor in previous running direction, system will cancel all the car calls.
F4-06-01	ON: the monitor input menu of the main board indicates that the signal is valid or invalid, which is the signal state processed through the input type. The default value is OFF.
F4-06-02	ON: Levels the car first to evacuate passengers on the nearest floor in the first place then return to base floor; OFF: Elevator won't level the car, but directly return to base floor and then open door and evacuate passengers.
F4-06-03	ON: Shielded communication interference ER29 fault.
F4-06-04	ON: The main board adds new high voltage input signal X32, which is used for short connection detection of rear hall-door and car-door. It is suitable for the main board of MU-V61 VM2. The default value is OFF. SJT-ZPC-V2A (VM1) type safety circuit boards must be used.
F4-06-05	ON: Elevator disable cabin overload signal, this is used in elevator 125% load test (This parameter cannot be saved. After power failure, it will resume OFF.); OFF: Overload signal enable.
F4-06-06	ON: When the elevator cannot open door in current floor (Open Door fault in controller), it will automatically go to the next floor and open door.
F4-06-07	ON: Floor number display change after elevator enter landing zone; OFF: Floor number display change after elevator change speed.
F4-06-08	ON: When elevator stops in inspection, brake will close after receiving zero speed signals to reduce impact.
F4-06-09	ON: Elevator can cancel registered car call while running (If all registered call canceled, elevator stop in nearby floor)
F4-06-10	ON: Force to use the curves without line segments.
F4-06-11	ON: Cancel emergency stop contactor in the Control cabinet.
F4-06-12	The high voltage entrance of the hall door and the car door are separately detected, x30 is the hall door, and the X31 is the car door.
F4-06-13	ON: In the control cabinet, the door interlock contactor is cancelled, the high voltage detection is used as the state detection of the door lock loop, and the detection and fault of the feedback of the door interlock contactor are cancelled.
F4-06-14	ON: Enable elevator function for disabled people. OFF: Disable elevator function for disabled people.
F4-06-15	ON: In Fire mode when elevator leaves fire floor then disables fire linkage output.
F4-06-16	ON: When door lock is closed, door close limit must be valid too, except inspection mode. OFF: Door lock state is not related to door close limit. Forced detection of bypass operation cannot be cancelled even if it is set to OFF.
F4-06-17	Only for internal test. Remain the default OFF state.
F4-06-18	ON: In two-door mode, elevator only installs one set of door open& close buttons. OFF: In two-door mode, elevator installs two sets of door open & close buttons.
F4-06-19	ON: Enable re-levelling with door open function. (Need to use SJT-ZPC-V2A re-levelling control board) OFF: Disable re-levelling with door open function.
F4-06-20	ON: Enable door open in advance function. (Need to use SJT-ZPC-V2A re-levelling control board) OFF: Disable door open in advance function.

CHART 2.2.6 SPECIAL FUNCTION LIST (CONT'D)

Number	Instruction
F4-06-21	ON: In inspection mode, door cannot open outside levelling zone. OFF: In inspection mode, door can open at any position.
F4-06-22	Previous versions of IECS_7122: ON: 3-phase 380V 50Hz power supply (with back-up generator) OFF: Battery power supply (disable DC-BUS under voltage fault) IECS_7122 and later versions: ON: Add communication of bottom pit inspection board, slow down and up down in the bottom pit in inspection mode, so that If it does not connect with the bottom pit, it will be forced to inspection state, and cannot resume the normal operation.
F4-06-23	ON: Use SJT-300/201 rope socket weighing device based on CAN BUS; OFF: Use SJT-151 under cabin weighing device based on RS-485.
F4-06-24	ON: secondary-terminal switch is adopted for elevator speed <2m/s (it is generally used in 1.75m/s elevator for two steps forced deceleration.) OFF: Secondary-terminal switch is not adopted for elevator speed below 2m/s.
F4-06-25	ON: In inspection mode door open/close switch in car is **invalid;** OFF: In inspection mode door open/close switch in car is **valid**;
F4-06-26	ON: Close light-load anti-nuisance function, passengers can input more than three car calls in light-load.
F4-06-27	ON: Change direction after zero speed. OFF: Change direction after brake is off.
F4-06-28	ON: Use light curtains/safety plates separately, the light curtain signals can be shield when the light curtains adhesion or in fire mode for more than 2 minutes. When this function is enabled, the light curtain and the touch plate signal of the original car are transformed into a pure light curtain signal. The driver mode up and down direction of the original car are transformed into a safe touch plate signal of the front and rear door, after shielding the light curtain, it will only detect the touch plate signal after the light curtain adhesion.
F4-06-29	ON: Motor operation & internal star-sealed contactor are used separately, Y8 as Internal star-sealed contactor output control; OFF: Operation contactor has internal short-circuit function.
F4-06-30	ON: Integrated controller LED has reverse display. This is used for G-series cabinet in MRL elevator (where control board is placed reversely) OFF: Integrated controller LED has normal display. (Default Settings)
*F4-06-31	**ON: Manual door function, opening and closing operation is controlled by the passengers manually, and the system no longer outputs the opening and closing signal.**
*F4-07-00	**Previous versions of IECS_7122:** 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. **IECS_7122 and later versions:** Spare. (If ARD function is active, the driver has been able to automatically determine the heavy load direction. Please use F4-07-25.) **IECS_7125 and later versions:** Brutal drive elevator emergency operation to let car slip and self-rescue with ARD. When system is in ARD mode, it only opens the brake but does not run the elevator; instead car will slip slowly to leveling zone by the weight or the counter weight, and then stop.

CHART 2.2.6 SPECIAL FUNCTION LIST (CONT'D)

Number	Instruction
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: Disable top/bottom limit signal, use another mechanism to detect limit signal: a. Top terminal/down door zone valid + up door zone invalid = Top limit; b. Bottom terminal/up door zone valid + down door zone invalid = bottom limit.
F4-07-03	ON: Enable serial connected electric lock.
*F4-07-04	ON: elevator door-open and hold function. (Including base station floor, internal selection and external call, then automatically close the door.)
F4-07-05	ON: Enable serial connected fire-linkage signal.
*F4-07-06	**Previous versions of IECS_7122:** ON: Y11 relay is defined as integrated controller fault indication output. Y11 is valid when fault occurs, and Y11 is invalid without fault. (This function cannot be used simultaneously with F4-07-11 or F4-07-17.) **IECS_7122 and later versions:** ON: the input type of serial fire-linkage signal is reversed. (If you need the fault output function of the original Y11 relay, please set the F3-08 Y11 output function to 16.)
F4-07-07	ON: Enforce the hitting ceiling and touching ground protection. If car speed inside leveling zone is still faster than rescue speed, then the car will be forced to stop in leveling zone by leveling zone correction.
F4-07-08	ON: Main board X25 input is used as over load signal input.
F4-07-09	ON: Main board X24 input is used as full load signal input.
*F4-07-10	**Previous versions of IECS_7122:** Main board X19 input is used as light load signal input. Note: The brake feedback function must be disabled. (When brake feedback is forced to be enabled, above function is invalid) **IECS_7122 and later versions:** ON: When the elevator is running in duplex/group mode with generator, the elevator will return to the base station in turn. The A ladder will return first and then the B ladder will return.
*F4-07-11	**Previous versions of IECS_7122:** Use for selecting if there is unintended car movement protection device or not. On: Yes, Y11 will output signal to act safety brake. **IECS_7122 and later versions:** ON: When the elevator is running in duplex/group mode with generator, after the elevators have returned to the base station in turn, the elevators set to ON will restore normal service. (If the safety brake trigger signal output of the original Y11 relay is required, please set the F3-08 Y11 output function to 18.) **Note: If the safety brake of the Y11 relay triggers the signal output correctly in the event of accidental movement protection in the car, and the special function of the F4-07-26 roller protection function should be opened in advance.**
F4-07-12	ON: In Auto(normal) mode, car stops three times answering car call without light-curtain action, the car call registration will be cleared.
F4-07-13	ON: Enable door-squeezing function to avoid door lock circuits open frequently in auto running mode which is caused by door operator lacking self-locking force.
F4-07-14	ON: Modular integrated controller, increasing modular car top communication.
F4-07-15	On: During self-rescue leveling in emergency and self-save leveling outside door zone, the beeper on the COP keep alarming (the interval is 1 second) while the car is moving.
F4-07-16	On: The elevator can run between an ultra-short floor spacing（less than 80cm& more than 30cm）.

CHART 2.2.6 SPECIAL FUNCTION LIST (CONT'D)

Number	Instruction
*F4-07-17	**Previous versions of IECS_7122:** ON: In UPS running mode, elevator will arrive into leveling zone, open the door, close the Y11 relay in 30 seconds, and cut off the UPS circuit to avoid a deep discharge of the UPS battery pack. (This function cannot be used simultaneously with F4-07-06 or F4-07-11.) **IECS_7122 and later versions:** ON: Enable the VIP mode, receive the 63 floors up call or down call of the calling board to enter the VIP recall mode. (If the UPS outage signal output of the original Y11 relay is required, please set the F3-08 Y11 output function to 17.)
F4-07-18	ON: The car waits at homing floor with door open.
F4-07-19	ON: In UPS running mode, the elevator will return to homing floor directly. While ON, F4-07-00 and F4-07-25 will be ineffective.
F4-07-20	ON: Enable TIM Stop Floor function. Stop floor time set1 Start time: F2-18 & 19; End time: F2-20 & 21 TIM stop floor time set1 corresponds Set Stop Floor parameter is: F4-00 Set Stop Floor1, F4-01 Set Stop Floor2. Stop floor time set2 Start time: F2-14&15; End time: F2-16 & 17(multiplexing start time/stop time setting). TIM stop floor time set2 corresponds Set Stop Floor parameter is: F4-02 Set Stop Floor1, F4-03 Set Stop Floor2.
F4-07-21	ON: With one and only one door zone signal, the elevator will still level while it turns from inspection to auto or from error to normal or runs in ARD mode. It will avoid that the car door vane cannot drive the hall door when it is too short.
F4-07-22	On: disable the car arrival-bell to avoid disturbing during 22:00 ~ 7:00am.
*F4-07-23	ON: When floor counting error occurs in up running except top floor or down running except bottom floor, elevator slow down and stop, but not suddenly stop.
F4-07-24	ON: Elevator return to homing floor to proofreading level number when power on for the first time.
*F4-07-25	ON: Before self-rescue, open brake and keep the elevator at zero speed and lock the direction of torque, then self-rescue to opposite direction of the torque. While ON, F4-07-00 is ineffective.
F4-07-26	ON: Enable slide protection function; OFF: Disable slide protection function.
F4-07-27	ON: Enable brake force self-test function. Automatically start at 2:00AM or manually start by modify F4-07-30.
*F4-07-28	ON: Add a new running mode. If X24 is effective in inspection mode, the car will automatically stop at 2 meters under door zone of top floor.
F4-07-29	ON: Levelling adjustment can be adjusted in layers, add adjustment value of 1~64 layer in parameters, all the Default values are 50mm. (The new adjustment method can be adjusted through the combination buttons in the car.)
*F4-07-30	Each time turn to ON from OFF, act brake force self-test once. Keep ON will be ineffective.
F4-07-31	ON: Enter a test mode, that elevator will continuous run without door open.

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

Chart 2.2.7 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	1.5	HZ	N
F6-00	Carrier Freq	Set controller carrier frequency.	6~15	8	kHz	N
F6-02	SpeedZoom	Speed Zoom (Reduce elevator actual running speed)	0~100	100	%	Y
F6-03	DirSel	Select motor running direction (0/1: Motor rotates anti- clockwise, car move down/up).	0/1	0	--	--
F6-04	Kp	Speed loop proportional gain. (Valid for complete curve if not used in multiple PI.)	0~65535	1000	--	--
F6-05	KI	Speed loop integral gain. (Valid for the complete curve if not used in multiple PI.)	0~65535	600	--	--

Chart 2.2.8 Multiple PI Setup Parameters List

Para No.	Display	Content	Range	Factory Setting	Unit	Live Chang
F7-00	PIMulEnable	Multiple PI parameters 1: Enable; 0: Disable	0/1	0	--	N
F7-01	PI1 Range	PI available range 1 (Start -middle speed running PI switch frequency)	0～Rated freq	5.0	Hz	Y
F7-02	PI2 Range	PI available range 2 (middle -high speed running PI switch frequency)	0～Rated freq	0	Hz	Y
F7-04	PI3 Range	PI available range 4	0～Rated freq	0.5	Hz	Y
F7-05	Kp1	PI available range 1 proportional gain	0~2000	1200	--	Y
F7-06	Kx1	PI available range 1 integral gain	0~2000	900	--	Y
F7-07	Kp2	PI available range 2 proportional gain	0~2000	1000	--	Y
F7-08	Kx2	PI available range 2 integral gain	0~2000	600	--	Y
F7-11	Kp3	PI available range 4 proportional gain	0~2000	600	--	Y
F7-12	Kx3	PI available range 4 integral gain	0~2000	500	--	Y

Chart 2.2.9 Encoder Setup Parameters List

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

Chart 2.2.10 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

Chart 2.2.11 No-load Compensation Setup Parameters List

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

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

Chart 2.2.12 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

Spare parameter (FD) is reserve parameter group, FD-00 to FD-27, totally 28 spare parameters.

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

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

Please select the function that you need to open according to the chart 2.2.13, then set the value of the corresponding position to 1, and then convert the binary value of the whole table to the decimal value to set the FD-XX parameter. The formula is as follows:

$$FD\text{-}XX = BIT0*2^0+BIT1*2^1+BIT2*2^2+…+BIT15*2^{15}$$

Chart 2.2.13 Spare parameter table (FD group)

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

Setting example 1:

When function 12 is enabled, the binary value is 0000 1000 0000 0000 (Bit15~Bit0, Bit11 is 1, the rest is 0).
Converted to a decimal value of 2048 (2 of the 11th Party =2048).

Setting example 2:

Enable function 1, function 2 and function 10 at the same time, the binary value is 0000 0010 0000 0011. (Bit15~Bit0, Bit9, Bit1 and Bit0 are 1, the rest is 0)
Converted to decimal numeric value of 515. (9 square of 2 + 1 square of 2 + 0 square of 2 =512+2+1=515)

Chart 2.2.14 Spare parameter 6 (FD-05)

Num.	Function definition	Meaning
Function 1	Maintenance operation mode	ON: Open the maintenance operation mode. The main board X5 is the maintenance input signal. It is necessary to reopen this function under the provincial limit mode (F4-07-02=ON), not respond to the call request in the process of maintenance, and the operator is displayed as a special purpose. It only serves the selected instructions in the car and the selected instructions with operating device, which is used for elevator normal running. OFF: Close the maintenance operation mode.
Function 2	Earthquake evasion function	ON: Opens the earthquake evasion function. When the main board X21 earthquake input signal is valid, the elevator will clear all the registered external call signals, and then open the door to evacuate the passengers at the nearby floor. If the special function parameter F4-07-15 is set to ON, after opening the door, a buzzer sounds every second. When the door is evacuating, the elevator control system determines the current position of the car. If the balance position interval between the weight and the car in the hoistway is found (within the range of positive and negative 2 meters), the elevator enters the circumvention balance position mode, the car tries to close the door, and after the door is closed, the elevator automatically registers an internal selection instruction of the parked floor above the balance position (which can automatically avoid the non-stop floor). Then run upwards to the parked floor to open the door. Then it reports ER25 fault and waiting for the manual reset earthquake monitoring switch to resume the ER25 fault. OFF: Close the earthquake evasion function.

Chart 2.2.14 Spare parameter 6 (FD-05) (Cont'd)

Num.	Function definition	Meaning
Function 3	Inspection run in power off emergency operation	ON: Inspection cannot run in power off emergency operation; OFF: Inspection can run in power off emergency operation.
Function 4	ER39 reset method	ON: ER39 error can only be reset once the system successful complete braking force self-test; OFF: In inspection mode, pressing both slow up and slow down buttons for 5 seconds can reset this error.
Function 5	Car call cancellation function	ON: Disable car call cancellation function; OFF: Enable car call cancellation function. Click the car call button again can cancel this car call, according to F4-06-09.
Function 6	Light curtain abnormal alarm	ON: If light curtain is adhering for more than 2 minutes or it lose effectiveness (no action for 8 continuous car call running), car buzzer will alarm; OFF: Turn off this function.
Function 7	Hall door and car door bypass detection method selection	ON: Using SJT-BDD-Vn board to detect hall door and car door bypass, instead of using SJT-ZPC-V2A safety circuit board. When activate this function, car releveling, advance door opening and synchronous machine UCMP testing functions will be disabled. OFF: Using SJT-ZPC-V2A safety circuit board instead of SJT-BDD-Vn circuit board.
Function 8-16	Spare	

Chart 2.2.15 Spare parameter 22 (FD-21)

Num.	Function definition	Meaning	default
Fun 1	Shielded input phase deficiency protection	Set to 1, will shield the input phase deficiency protection function	0
Fun 2	Spare		0
Fun 3	Shielded output phase deficiency protection	Set to 1, will shield the output phase deficiency protection function	0
Fun 4	Shielding open/shorted circuit inference protection	Set to 1, shield the first power on short circuit to inference protection function. If the external fault condition is not relieved and shield it directly, the power module will be damaged.	0
Fun 5	Shielding temperature adaptive protection	Set to 1, shielded temperature adaptive protection function	0
Fun 6	Shielding voltage drop adaptive protection	Set to 1, shielded voltage drop adaptive protection function.	0
Fun 7	Shielded single loop self-learning	Set to 1, shielded single loop self-learning function	0
Fun 8	Shielding automatic calculation of motor pole logarithm	Set to 1, shielded automatic calculation of motor pole logarithm function.	0
Fun 9	Shielding extended operation mode of asynchronous motor	Set to 1, shield extended operation mode of asynchronous motor.	0
Fun 10	Turn on initial position tuning large pace voltage output	Set to 1, increase voltage output when tuning for motor with large internal resistance.	0
Fun 11	Shielding the opposite direction mark that is compulsory built by no-load compensation operation	Set to 1, shield the opposite direction mark that is compulsory built by no-load compensation operation.	0
Fun 12-16	Spare		0

Chart 2.2.16 Spare parameter 23 (FD-22)

Num.	Function definition	Meaning	default
Fun 1	Spare		0
Fun 2	Spare		0
Fun 3	Spare		0
Fun 4	Shielding No.159 drive fault	Set to 1, shielding No. 159 drive fault. Please use this function cautiously. If external disturbance is not released, it will cause motor stall and safety risk.	0
Fun 5	PWM Fan Enable	Set to 1, the system starts or stops the fan according to the real-time temperature in the driver board, if the temperature is higher than 45 degrees, the fan starts, when below 40 degrees, and the fan automatically stop.	0
Fun 6	The first power on automatically enters the motor static tuning	Set to 1, every time the system is powered up, the motor static tuning will be started for the first running, and the original value of FC-00 will be recalibrated.	0
Fun 7	Forced drive mode enabled	Set to 1, the control system will realize pre-torque compensation according to the forced drive mode. This function is restricted to the elevator system with forced drive mode and cannot be used for traction mode.	0
Fun 8	Optimize initial position tuning time	Set to 1, skip the UD trial process, and reduce tuning time.	0

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

Chart 2.2.17 Spare parameter (Byte setting group)

Num.	Function definition	Meaning	Range
FD-04	Maintenance reminder function	Set FD-04 to non-zero number to activate maintenance reminder function, this number means the maintenance period in days. For example, set FD-04=100, which means the maintenance period is 100 days. Thus, this elevator needs to have maintenance at least once in 100 days, otherwise, it cannot operate. Car display and hall display will indicate 'MO'.	0～1000
FD-07	Weighting offset coefficient	Used to set weighting offset coefficient, set to 0 or turn off the load weighting enable function (F1-29=0) will disable this function. When it sets to a non-zero value, the weighting value will have this amount compensation in its positive direction.	0～100%
FD-25	Rope slipping mode	After setting FD-25 to 1, the system enters the slipping mode. At this time, pressing slow up / slow down button, the system will output the limiting current, so that the limit slip state of the rope can be observed. After setting FD-25 to 1, set the non 1 value again, that will be automatically cancel the slipping mode.	0～1
FD-26	Elevator balance coefficient	Balance coefficient of elevator. （Unit, %） For FD-24 to 26..	40～50
FD-27	The radio of output current when elevator is empty loaded and travelling down, to the rated motor current	The radio of the output current when elevator is empty loaded and travelling downward, to the rated current of motor. (Unit, %)	30～130

3. Environmental Parameters

Chart 2.3.1 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	000000	Y
A0-04	Contrast	Setting the LCD contrast level	0~10	5	N

Chapter 3 Elevator System Faults

CHART 3.1 ELEVATOR SYSTEM FAULT LIST

Error Code	Definition	Possible Solution
Er2	Door inter-lock faults: Door inter-lock circuit open at elevator running	Check the work condition of door vane and door interlock circuit. Roller should have enough space at both side of the vane.
Er3	Driver faults	Check driver fault code, find the cause of fault, and resolve it.
Er4	Elevator running in opposite direction with command	1. Exchange phase "V" and "W" on motor 2. Exchange phase "A" and "B", on encoder terminal block or change in parameter setup.
Er5	System does not receive brake open feedback signal after output brake open command: 1. No X17(X15/X19) feedback after Y7 output 0.5s (2s). 2. X17/X15 enable when Y7 has no output.	1. Check the traction machine brake detection switch and wiring; 2. If no feedback switch, should set feedback enable to OFF; 3. The fault is not recoverable. It needs to be manually reset by pressing both slow up and slow down for 5 seconds.
Er6	During elevator running, leveling zone input signal X9, X10 is always on.	Check leveling zone signal circuit and induction switch
Er7	Encoder pulse not enough at elevator running.	Check the wiring from encoder to controller.
Er9	Running contactor output not matching feedback signal: 1. After Y9 output, X16 has no feedback in 0.4s. 2. X16 is enabled when Y9 has no output.	Check the Running contactor coil and output/feedback circuit wiring.
Er10	Safety circuit open, X13, X29 input are invalid.	Check safety circuits.
Er11	Leveling switch signal missing: Elevator is running pass the floor, but there is not input at X9 /X10.	Check the leveling switches and its wiring.
Er12	Elevator pass top limit switch (X5 is invalid)	Check the encoder, top limit switch including its position and wiring.
Er13	Elevator pass bottom limit switch (X6 is invalid)	Check the encoder, bottom limit switch including its position and 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; 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 controller PI gain parameters; Check the braking resistor specification 2. Make elevator running curve smoother. 3. Do hoistway parameter learning again.
Er21	Single running time is over set time	1. Check the traction rope for slip or car jam. 2. Check related parameters in drive; 3. Check value of parameter "Over Time". 4. Reset the error by pressing both up and down buttons for 5s in inspection mode (7125 and later versions). 5. Reset the error by turn the system power off and on again (versions before 7125).
Er22	Elevator has inspection signal input (X10 invalid) at elevator normal running.	Check inspection switch and related circuits.

CHART 3.1 ELEVATOR SYSTEM FAULT LIST (CONT'D)

Error Code	Definition	Possible Solution
Er23	One of two leveling switch (X9, X10) is invalid at elevator normal running.	Check leveling switches and wirings.
Er25	Heat sensor protection: Braking resistor or motor is over heat (X21 invalid).	Check heat sensor circuit. If this error cannot reset in 90s, Y10 relay on controller will output KMC contactor open signal.
Er26	Door inter-Lock contactor working state does not match to its coil (X14, X30 input different)	Check door interlock contactor terminal & coil and their related terminal on controller.
Er27	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) switch fault. (X7 or X8 valid when elevator outside their floor)	Check for terminal switches location and their wirings.
Er29	Communication interference too much (In system or in duplex communication).	1. Check system ground condition. 2. Check COP/LOP for possible damage that may influence CAN BUS communication.
Er30	Door open fault (car cannot open door)	1. Run elevator in inspection mode, give door open command and check Y4 for output signal. 2. If Y4 has no output, need to check door open, close limit switch and related signal. 3. When used as a rear door, please check whether the front door and back door were set opposite.
Er31	Door close fault (car cannot close door)	Normally due to door not installed properly and short circuit door interlock circuit. Check if door close and door interlock circuit are output at same time.
Er32	Floor number counting error.	A sudden power break may affect terminal/limit switches and cause floor number error. Elevator will then return to bottom floor for recalibration.
Er33	Motor star-sealed contactor fault	Star-sealed Contactor fault: Star-sealed Contactor command not match feedback signal: 1. Y8 output, X11 has no feedback in 0.4s 2. Y8 has not output, X11 is valid 3. Y8 has been cancelled, X11 has no feedback in 0.4s.
Er34	External power +24V drop down error	Check the connection of external power +24V. When system finds the voltage is lower than 16V, this error occurs.
Er35	System clock error	The circuit hardware on main board works abnormally, please contact with our factory.
Er36	Internal power +5V error	When system finds the power of 5V is lower than 4.7V, this error occurs.
Er37	Running contactor vibrate while brake opening	Check the action of running contactor and its feedback X16.
Er38	Star-sealed contactor vibrate while brake opening	Check the action of Star-sealed contactor and its feedback X11.
Er39	Brake force detection fail, lack of brake force.	Check the brake, power off then on or disable brake force self-detection. The fault is not recoverable. It needs to be manually reset by pressing both slow up and slow down for 5 seconds. (If FD-05-03=ON, this error can only be reset after once success brake force test. Pressing both slow-up button and slow-down button for 5 seconds will not clear this error.)
Er40	Brake invalid and car slide error	Safety protection function act. When system find the brake invalid, it controls the car creep around door zone to release passengers and then return to top floor and brake off again, but brake still fail to close. System announces brake invalid error and locked, will not recover until reset.

CHART 3.1 ELEVATOR SYSTEM FAULT LIST (CONT'D)

Error Code	Definition	Possible Solution
Er41	Unintended slide error, pay attention to brake force.	Safety protection function act. When system finds the brake invalid, it controls the car creep around door zone to release passengers and try to brake off. During the creeping, the brake successfully turns off. System records this slide error as a warning of brake force but not display error. You can see it in Fault Record.
Er42	While ARD mode, system find brake force invalid.	The car slides, system announces error and record it to prevent power of UPS drop too low during creeping. Unless it may cause unpredictable danger.
Er43	Safety protection function act, the car runs out of door zone while re-leveling and caused door circuit cut off. System announces door zone missing and lock the error until reset.	Remind maintenance man to solve the problem of door zone missing. To prevent door zone missing happens as well as brake force invalid, or creeping will cause the car run out of safety range.
Er44	While safety protection function works, signal of up limit has vibrated.	Safety protection act, then car creep around door zone. While up creeping, the signal from up limit(X5) vibrated. System will record this error and lock the error until reset.
Er45	While safety protection function works, signal of down limit has vibrated.	Safety protection act, then car creeps around door zone. While down creeping, the signal from down limit(X6) vibrated. System will record this error and lock the error until reset.
Er46	While safety protection function works, signal of up terminal has vibrated.	Safety protection act, then car creeps around door zone. While up creeping, the signal from up terminal(X7) vibrated. System will record this error and lock the error until reset.
Er47	While safety protection function works, signal of down terminal has vibrated.	Safety protection act, then car creeps around door zone. While down creeping, the signal from down terminal(X8) vibrated. System will record this error and lock the error until reset.
Er48	Parameter of safety protection function has been wrongly set.	Enable safety protection but disable open in advance & re-level function.
Er49	Miss safety door zone signals.	Enable safety protection but cannot find door zone signals at leveling position.
Er50	Parameter setting is not proper.	Check the follows parameters: If Park floor, Homing floor or Fire Floor has been set to non-stop floor; If both front door and rear door is disabled in two door mode; Group control is enabled with duplex control or two door mode.
Er51	Drive module overheat protection.	When running, drive module met overheat protection. Elevator stopped at nearest floor.
Er52	The up and down door zone signals are opposite.	Exchange up and down door zone signal wires.
ER53	For fire elevator, The CAN communication between elevator integrated controller and absolute value coding communication board is failure.	Please check the CAN communication connection, or whether the absolute value coding communication board is installed, for the special fire elevator program, the absolute value check function cannot be turned off.
ER54	Fire elevator: The floor count of the absolute encoder and the floor count of controller are not equal (split floor). Non-fire elevator: For manual door elevator, light curtain obstructs error and car slows down to stop.	1. Fire elevator: Please run the elevator to the lower limit in inspection mode, repeat the hoistway learning, and then resume to the automatic operation mode. If the ER54 fault appear again, that means the magnetic bean become demagnetization or the code switch abnormality, please check the floor code from the top of the car with inspection mode. 2. Non-fire elevator: Light curtain is active during car running, check whether the light curtain signal is normal.
ER55	For fire elevator, the encoding of elevator integrated controller absolute value coding communication board is abnormal (the encoding floor counting is more than the total floor).	Absolute floor coding confusion, probably because the bi-stable switch is not operated by the magnetic bean or magnetic beans degaussing, please check the floor code from the top of the car with inspection mode.

CHART 3.1 ELEVATOR SYSTEM FAULT LIST (CONT'D)

Error Code	Definition	Possible Solution
Er56	Door close limit abnormal error	1. When F4-06-16 = ON, or system is in door lock bypass operation, the door close limit is constantly inactive; 2. When system is in automatic mode and elevator is in leveling position, or when system is in inspection mode. The door lock is open, but door close limit is constantly active; 3. Please check whether the door close limit signal and car signals are correct.
Er57	CAN communication abnormal error	Car top communication loses for modular system. Or when F4-06-22=ON, pit inspection board communication loses. Check whether car top control board and pit inspection board are working properly.
Er58	Brake feedback switch X15 signal is abnormal.	Check the feedback wiring of the X15 brake microswitch or F3-00-15 input type.
Er59	Brake feedback switch X19 signal is abnormal.	Check the feedback wiring of the X19 brake microswitch or F3-00-19 input type.
Er60	UCMP fault	The inspection state is required to be reset at 5 seconds according to the slow-up and slow-down buttons.
Er62	Haven't used X31 as hall door detection, but X31 is effective. Or have no door contactor but X14 become effective.	1. Check if X31 is effective when F4-06-12 is OFF; 2. Check if X14 is effective when F4-06-13 is ON.
Er64	ARD car slip zero speed overtime	Brutal drive elevator, when in ARD car slip self-rescue operation, system opens the brake, but car is not moving in 2 seconds. Please check if the cabin or the brake is jammed. Non brutal drive elevator, please check whether special function F4-07-00 is accidently enabled.
Er65	ARD car slip over speed	Brutal drive elevator, when in ARD car slip self-rescue operation, the car slipping speed is over 0.3m/s, please check whether the star-sealed contactor is working properly or the encoder feedback is correct.
Er66	ARD car slip overtime	Brutal drive elevator, when in ARD car slip self-rescue operation, a single operation takes more than 150s and not yet to find a leveling position. Please check the leveling signals are correct.
ER86	The top terminal input is valid, but secondary top terminal input is invalid (the end terminal switch is on the top car, so the secondary terminal must be reliable).	When the elevator speed is greater than or equal to 2m/s, or if the secondary terminal is enabled by F4-06-24, the integrated controller detects the timing sequence of the terminal and the secondary terminal.
ER87	The bottom terminal input is valid, but secondary bottom terminal input is invalid (the end terminal switch is on the top car, so the secondary terminal must be reliable).	When the elevator speed is greater than or equal to 2m/s, or if the secondary terminal is enabled by F4-06-24, the integrated controller detects the timing sequence of the terminal and the secondary terminal.
ER88	Terminal missing located in the top door area, but the top terminal input is invalid.	For the system that omits the top and bottom limit, the terminal signal is used to determine whether the elevator is running over limit with the door area signal combination. Therefore, if the elevator stops at the top floor, if the top terminal fault is not detected, please check the top terminal switch.
ER89	Terminal missing located in the bottom door area, but the bottom terminal input is invalid.	For the system that omits the top and bottom limit, the terminal signal is used to determine whether the elevator is running over limit with the door area signal combination. Therefore, if the elevator stops at the bottom floor, if the bottom terminal fault is not detected, please check the bottom terminal switch.
ER90	When the bypass is running, door-open completely signal and door-close completely signal is effective at the same time.	When the bypass is used in the inspection mode, the system detects door-close completely switch. If the door-open completely signal and door-close completely signal are effective at the same time, which indicates that the user has no connection or reversed the input type, so the system reported failure to prompt the user to connect wire, Otherwise, we cannot confirm whether the car door is properly closed.

CHART 3.1 ELEVATOR SYSTEM FAULT LIST (CONT'D)

Error Code	Definition	Possible Solution
Er91	The bypass operation signal of the door lock loop is detected fault.	Automatic operation is resumed, but bypass switch is not disconnected. Bypass check point X6 is effective. Check whether the bypass board plug-in is not restored or detect X6 input type.
Er92	The door-lock short fault, there is a sealing line in the hall door or the car door circuit.	Please check the loop to remove the short connection.
Er93	The operation of the safety circuit board is abnormal, and the function of the door lock short connection cannot be used normally.	Please check the relevant signal of the safety circuit board. There may be signal sticking in the safety door area, and the action of the re-leveling board is not controlled by the main board Y0.
Er94	The S curve Pb slope parameter is not set reasonably, the speed change distance is too large, the elevator may not be able to park at adjacent floor but can park at cross floor.	Please modify the curve Pb parameters.
Er95	During the single start operation, when the contactor is pulled in, the rear door Interlock loop jitter exceeds 20 times, and the door lock loop is abnormal.	Please check the door lock loop, there may be a virtual connection.
Er96	The control panel's external calling board communication protocol is bound up, inconsistent with the Integrated controller, and cannot use car call and landing call normally.	Please return to the factory or contact after-sale service to rebind the communication protocol.
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	Please contact with supplier.
Er99	Logic program locked.	Please contact with supplier.

Chapter 4 Driver Fault

CHART 4.1 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.

CHART 4.1 DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
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.
DF7	OS	**Elevator over speed** the speed feedback exceeds the speed limit and last longer than set time.	1. Max speed /last time set incorrect; 2. Speed over-tuning; 3. Encoder feedback incorrect; 4. Wrong motor parameters setting.	1. Check speed limit setting; 2. Check the P/I parameter; 3. Check encoder; 4. Check motor parameters.
DF8	OE	**Speed over deviation** the speed deviation exceeds the allowable range(F9-03) and last longer than set time.	1. System overload; 2. Accel/decel time short; 3. Parameter setting wrong; 4. Encoder cannot work properly; 5. Brake wrongly act; 6. Wrong allowable range set.	1. reduce system load; 2. Increase accel/decel time; 3. Check the parameters; 4. Check the encoder; 5. Exchange motor phase sequence or exchange A+/A- and B+/B- wire; 6. Check brake action.

CHART 4.1 DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
DF9	PGO	**PG disconnection** Did not receive encoder signal at operation. PG card type setting is different with actual one, system cannot identify it.	1. Encoder wiring break, loosen or wrong connection; 2. Encoder damaged; 3. Wrong PG type setting; 4. PG card damaged; 5. Brake not open.	1. check encoder wiring; 2. Check encoder; 3. Check if F8-02 PG type is same with actual PG card; 4. Check connection between PG card and main board; 5. Check if brake can open; 6. If software version is old, please enter Fault report->Controller Fault, and find E2, E3 value: Incremental encoder: (1)E3=35, no speed feedback; (2)E2=16, U/V/W signals error; Sin/Cos encoder: (1)E3=35, no speed feedback; (2)E3=29,31,36, abnormal communication between main board and SPG card; (3)E3=28 or 34, C/D signal error; (4)E3=32 or 33, A/B/C/D signals are highly similar; 7. If software version is new, these errors are DF18, DF19 and DF20.
DF10	FF	**Flash memory fault**	Data fault at saving parameters.	Please contact supplier.
DF11	BF	**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.
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.

CHART 4.1 DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
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.
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.

CHART 4.1 DRIVER FAULT LIST (CONT'D)

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

CHART 4.1 DRIVER FAULT LIST (CONT'D)

Error Code	Display	Definition	Possible Causes	Possible Solution
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 finds 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.

CHAPTER 5 BRAKING RESISTANCE CONFIGURATION

Model	Motor Power (kW)	Braking Resistor value (Ω)			Braking Resistor Total Power value (W)	
		Min	MAX	Typ.	Synchronous	Induction
400V (Voltage Range: 85%≤380V 3-phase ≤120%)						
U□4002-□□	2.2	90	200	100	600	500
U□4003-□□	3.7	70	110	80	1100	800
U□4005-□□	5.5	56	90	75	1600	1200
U□4007-□□	7.5	46	70	65	2200	1600
U□4011-□□	11	28	45	40	3500	2500
U□4015-□□	15	28	35	30	4500	3500
U□4018-□□	18.5	17	29	25	5500	4500
U□4022-□□	22	17	24	20	6500	5000
U□4030-□□	30	11	20	16	9000	7000
U□4037-□□	37	9	16	12	11000	9000
U□4045-□□	45	9	14	10	13500	10000
U□4055-□□	55	5	8	7	20000	18000
U□4075-□□	75	5	6	5	28000	25000
Model	Motor Power (kW)	Braking Resistor value (Ω)			Braking Resistor Total Power value (W)	
		Min	MAX	Typ.	Synchronous	Induction
200V (Voltage Range: 85%≤ 220V 3-phase ≤120%)						
U□2002-□□	2.2	45	56	50	600	500
U□2003-□□	3.7	28	37	30	1100	800
U□2005-□□	5.5	20	27	24	1600	1200
U□2007-□□	7.5	15	21	20	2200	1600
U□2011-□□	11	10	14	12	3500	2500
U□2015-□□	15	8	11	10	4500	3500
U□2018-□□	18.5	7	9	8	5500	4500
U□2022-□□	22	5	8	8	6500	5000

Due to ongoing product modification, data subject to change without notice