NEL
INNOVATION MATTERS
ELECTRONICS

USER MANUAL
SERIAL COMMUNICATION

NL3000

Integrated Elevator Controller

BRIEF INTRODUCTION

Naqsh-e-Lasani Electronics specializes in manufacturing, installation/commissioning, software programming, troubleshooting, repairing and maintenance of VFDs (Variable Frequency Drives).

We provide innovative technological solution for a wide range of clients in the manufacturing and industrial processes with the support of our team of qualified experts. We are manufacturing our own brand VFDs with rating 0.75kw to 630kw for various general as well as specific industrial applications. Our Famous Products are NL E5, NL ED200A, NL-E100, NL G5, NL3000, NL V6-M, NL D5-A, NL i580, NL-B5, NL C5.

WHY NAQSH-E-LASANI ELECTRONICS?

- Based on International Standards
- Experience from Different Industrial and Applications
- User Specific Requirements
- Technical Expertise
- High Quality Products
- Professional Serivces
- Customer Support & Feedback

FOREWORD

Thank you for purchasing NL3000 series elevator integrated controller (NL3000) manufactured by Naqsh-e-Lasani Electronics.

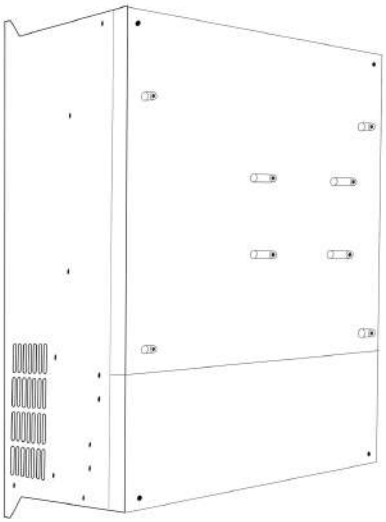
This User Manual describes how to use NL3000 and their installation wiring, parameter setting, troubleshooting and daily maintenance etc.

Before using the product, please read through this User Manual carefully. In addition, please do not use this product until you have fully understood safety precautions.

Note:

- Preserve this Manual for future.
- If you need the User Manual due to damage, loss or other reasons, please contact the regional distributor of our company or directly contact our company Technical Service Center.
- If you still have some problems during use, please contact our company Technical Service Center.
- Due to product upgrade or specification change, and for the purpose of improving convenience and accuracy of this manual, this manual's contents may be modified.
- Email address: **nel.indus@yahoo.com**

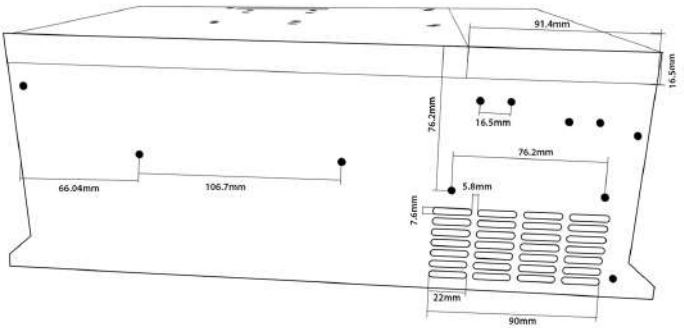
Front View



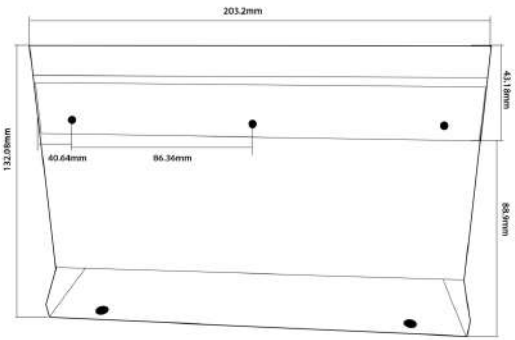
NL3000

7.5kw to 15kw

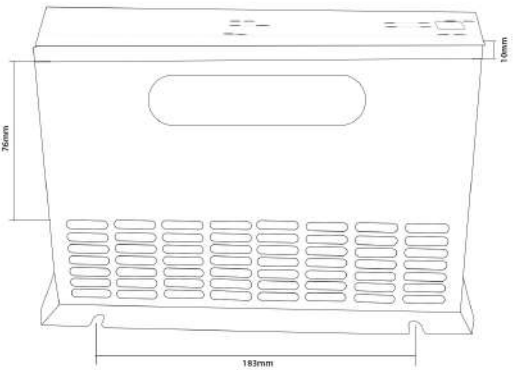
SIDE VIEW



TOP VIEW



Bottom View



NL3000 Technical Features

NL3000 series products which can meet needs of all elevator systems are the Intelligent Control System with Automatic control technology, Power electronic technology, Motor drive technology and Network communication technology.

More Advanced

- **Direct stop:** Based on the distance control, the direct stop technology realizes smooth speed and high operating efficiency.
- **Really integrated design:** It perfectly combines the elevator logic control and the motor drive, and achieves elevator integrated control using highly integrated single DSP.
- **Parameter auto-tuning free off load:** The Syn. motor and the Asyn. motor can do parameter auto-tuning free off load.
- **Start torque auto-compensation for no weighing device:** No need for the weighing device, you can achieve elevator start without impact, which adapt to a variety of encoders and motors.

Easier to Use

- **Convenient car debug mode:** In the car you can connect the keypad to the car car call board via the cable, and then you can debug the elevator and monitor its running state.
- Support Android phone debugging.
- Pre-torque auto-compensation: It makes debug more convenient and more consistent.
- The onboard small keypad design makes easier to repair and maintain the elevator.
- The input terminal high/low level of MCB board is selectable, and the I/O terminal function of MCB board can be flexibly set.
- The I/O terminal function of car top board and main/vice COP can be flexibly set.
- Two lines can realize the elevator parallel.
- Synchronous and asynchronous is integration with good commonality.

Safer

- ➔ Multi-security is assured which conforms to GB7588-2003 standard.
- ➔ The fault-tolerant design of hardware and software and many types of fault treatment protect the safe operation of the elevator.
- ➔ Professional inverter manufacturing technology.
- ➔ Strong environmental adaptability.
- ➔ Immediately locking the base electrode and switching off IGBT output at fault can avoid contactor arcing.

More Economical

- ➔ Three programmable high voltage 110 - 220VAC input interfaces can save the cost of system users.
- ➔ CAN and Modbus communication perfect combination can minimize the number of using cables.
- ➔ The system can be equipped with a minimum of three contactors (safety, brake, output).
- ➔ Full range of NL3000 is built-in braking unit, which can be configured the power regenerative unit to achieve four-quadrant operation and energy saving.

CONTENTS

Chapter 1
NL3000 Configuration

2 Chapter 1 NL3000 Configuration

1.1 Hardware Configuration

No.	Product	Model	Application	Number	Position	Remark
1	NL3000 elevator integrated controller	NL3000-XT-XXX Details refer to section 3.1 Model Description	Elevator control integrated controller	Each elevator configures one	Elevator control panel	Must be equipped Select the model according to motor power
2	Main control board (MCB)	NL-MCB-N	Elevator MCB board	Each elevator configures one	NL3000 or control panel	Must be equipped NL3000 has included
3	Keypad	NL-LED	For elevator adjustment		MCB/CTB/ HCB board of RJ45 terminal	Optional A / C- can store 1 group parameter B- can store 1 group parameter
4	Car top board (CTB)	NL-CTB-B	Car inside signal and MCB communication	Each elevator configures one	Car inside or car top	Must be equipped With double door control
5	Car command board (CCB)	NL-CCB-A	For acquisition floors and function button commands inside the car	Every 16 floors configure one	Inside elevator car	Must be equipped Each can be connected 24 buttons (16 floor buttons)
6	Display control board (car call board) (HCB)	NL3000-HCB-L NL3000-HCB-L5; NL300-HCB-LG	For inside car display	Each elevator configures one	Manipulator	Must be equipped The below can be only used for car call: NL3000-HCB-K NL3000-HCB-T5 NL3000-HCB-M2 NL3000-HCB-M3
7	Display control board (hall call board) (HCB)		For hall call landing and floor display	Each floor configures one	Outside calling box	
8	Advanced open block&UCMP	NL3000-AOB-D	For advanced door and OD re-leveling	Each configures one	Elevator control panel	OptionFal
10	Door controller	NL900	For door motor control	Each door motor	Car top	Optional

No.	Product	Model	Application	Number	Position	Remark
				configures one		
11	Encoder card	NL-PG1-ABZ	Asyn. motor	Each elevator configures one	NL3000	Optional Select according to the encoder type
		NL-PG2-SINCOS	Syn. motor			
12	IoT module	NL3000-CIC-C	House estate monitoring		Elevator control panel	Optional
13	Voice announcement	NL3000-CHM-B	Voice announcement		Inside the car	Optional
14	Group control board (gCB)	NL3000-GCB-A	For elevator group control	Group control elevators share one	Machine room	Optional

1.2 Function Table

Standard Function					
1	Auto run	2	Driver run	3	Inspection run
4	Self-rescue back to leveling run	5	Firefighting back to base station run	6	Fireman run
7	Isolated run	8	Advanced OD run	9	OD re-leveling run
10	Testing run	11	Parallel run	12	Inspection OD/CD operation
13	Keypad OD/CD operation	14	Auto back to base station run	15	Locked-elevator function
16	Timing auto OD/CD elevator	17	Anti-nuisance function	18	Time-sharing, peak function
19	Full selective	20	Up selective	21	Down selective
22	Separate wait	23	Peak service	24	Real-time clock management
25	Shaft self-learning function	26	Full-load by pass	27	Over-load protection

Standard Function					
28	Lighting and fan energy-saving function	29	Reverse cancelling	30	Floor service set for front and back door
31	Door machine multi-mode operation	32	Open-through door control modes	33	Open the door outside this hall
34	OD button open the door	35	Auto open door at power up	36	Repetition of door closing
37	Forced close door	38	CD button advanced close door	39	Category setting for the time keeping door open
40	Keep open function	41	Miss delete car command	42	Floor display by any setting

43	Various hall data display formats	44	Floor service setting	45	Car arrival chime
46	Outside approaching chime	47	Outside arrival chime	48	Double hall call on the same floor
49	Hall call adhesion recognition	50	Weighing signal compensation	51	Vice COP operation
52	Car location automatically correct	53	User calibration menu	54	Earthquake control function
55	Current aslant remove	56	VIP service floor	57	Brake force detection

Optional Function					
1	IC card user management	2	Voice announcement	3	Manipulator operation for handicapped persons
4	Quarter monitoring	5	Phone debugging		

Protection Function					
1	Fault history	2	Over-speed protection	3	Protection of excessive speed deviation
4	Encoder reverse protection	5	Encoder disconnection protection	6	Door light curtain protection
7	Non-open outside door zone	8	Door fault protection	9	Protection of door-lock disconnect when running
10	Door lock jump detected function	11	Next landing	12	Leveling switch fault protection
13	Limit switch protection	14	Anti-slip protection	15	Contact protection of contactor
16	Motor over-load protection	17	Over-current protection	18	Over-voltage protection
19	CPU overheated protection	20	Shaft self-learning fault protection		

1.3 Standard Function Description

Standard Functions		Description	Remark
1	Auto run	1. Arrive to station and automatically open the door. 2. Automatically delay closing the door. 3. Manually close the door early. 4. Hall call forward automatic interception. 5. Hall call reverse highest (or lowest) automatic interception.	**Normal/inspection switch turns to normal position;** Inside the car, the auto/driver switch turns to auto position;
2	Driver run	At the driver running mode, the elevator does not have auto close door function controlled by the elevator driver, and the driver can choose the direction and straight running function.	F26.02
3	Inspection run	After press the inspection switch, the elevator will access to the inspection state, and the system will cancel auto run and operation of automatic doors. Pressing the up/down buttons will enable the elevator run to up/down at inspection speed. Release the button to stop the elevator immediately or decelerate to zero. More details see F26.12	**Hall call LED:** Alternately display floor and INS information, and light the inspection lamp **Hall call LCD:** Display the inspection mark
4	Self-rescue back to leveling run	Running conditions are met, if the elevator stopped at the non-leveling area, elevator will run at 0.200m/s to the nearby leveling area. **1. When detect any one of the up or down leveling signal:** The elevator will decelerate from the inspection speed to the re-leveling speed. **2. When detect both of up and down leveling signals:** After the delay time passing the leveling park, decelerate from inspection speed to zero speed, stop and then open the door.	
5	Firefighting back to base station run	After fire switch action, the system enters firefighting run mode: 1. The system will clear all of the hall call and car call. 2. Automatically return to firefighting base station. 3. NO door. 4. After return to fire base station, output the fire linkage signal. • If the elevator is reversely running, stop on the near floor without open door, and direct run to fire base station, NO.	**Hall call LED:** Alternately display floor information and F **Hall call LCD:** Display firefighting mark
6	Fireman run	At the fireman run mode, the door does not automatically open or close. Only press the button can make the door action. • The elevator only response to one command in car once. • Only when the elevator open the door stopped at the base station, reset the fire switch and fireman switch, the elevator can run normally.	

Standard Functions		Description	Remark
7	Isolated run	At isolated running mode, the elevator does not response to hall call and close the door automatically. • If the elevator is in parallel control and group control, it will be out of group control, and independent running.	Hall call do not display Set F26.07 = 1
8	Advanced OD run	At the auto run mode, the speed during stopping process is less than the advanced open speed and the door signals are effective, system opens the door ahead of time through shorted lock- door signal door-close contactor to reduce the passenger waiting time.	Configure NL3000-AOB-A Set F26.05 = 1
9	OD re-leveling run	The elevator stopping at the floor station, due to a large number of persons or goods entering and leaving, the leveling fluctuated because of the elastic deformation of elevator wire rope and the rubber, make inconvenience to people and goods entering or leaving. System allows run automatically at the speed of re-leveling to leveling station in the OD state.	Configure NL3000-AOB-A Set F26.04 = 1
10	Testing run	Testing run is including the new elevator fatigue test, the shielding of hall call, OD/CD and over-load etc signals, the setting of any running times, and the allowable elevator random run etc.	F25.04
11	Parallel run	Two elevators through CAN bus for data transmission, to coordinate hall call and improve running efficiency.	F21.05 = 2 F21.06 = 1 main elevator, F21.06 = 2 vice elevator
12	Inspection OD/CD operation	After elevator entering the inspection state, if door-lock circuit disconnects, via pressing the up/down button the system will send out CD command. If door-lock circuit connects, the elevator will up/down run; If the elevator stopped at the position of the door zone, while pressing the up/down buttons, the system open command is given, and do the opening operation.	
13	Keypad OD/CD operation	Keypad's **RUN** key to perform OD operation. **STOP** key to perform CD operation.	
14	Auto back to base station run	When beyond the setting time and there is no car call and hall call, elevators automatically return to the base station and wait for passengers.	

15	Locked-elevator function	At the auto run mode, after the elevator locked, the system eliminates all hall calls.
		• If there is car call registration, after registered, the elevator will automatically return to locked-elevator base station then open the door.
		• If there is not car call registration, the elevator will directly return to locked-elevator base station. After that:
		  • Hall call box and car display the stopping mark "凸" for 10s. Then close the display, elevator automatically closes the door, turn off the car lighting, and the car and hall call displays extinguish.
		  • Pressing the OD button can open the door, 10s later, restart to close the door and turn off the car lighting.
			After complete the locked-elevator, the car and hall call LCD do not display "凸", and directly close

Standard Functions		Description	Remark

16	Timing auto OD/CD elevator	According to the preset time of opening/closing elevator, the system open and close the elevator automatically.
		• Using 24-hour of time representation.
		• Setting the time of automatically open and close the elevator to 00:00 can cancel this function.
		• This setting function will not work if the locked-elevator switch is valid.
		• During the auto locked-elevator period, if require to run, you can operate as following:
		  • Turn the locked-elevator switch from on to off, wait for 1s, spin to on, the system enter to the forced operational state and can normally run.
		  • After finish, turn the locked-elevator switch from on to off, wait for 1s, spin to on, the system will enter to timing locked-elevator state.
			Set actually F26.33, F26.34

17	Anti-nuisance function	1. According to the weighing signal: • System identifies the number of passengers in car in accordance with the analogue weighing signal or light-load digital signal, and automatically determines the number of passengers inside and comparison with the instructions registered in car. • If an excessive number of calls registered, then the system considers it is anti-nuisance state and cancels all calls in car. 2. According to the light curtain signal: • If the elevator is for landing for consecutive three times and the light curtain is no action, the system will consider to be in anti-nuisance state, and clear all registered car call command.	F05.07
18	Time-sharing, peak function	The system is built-in clock chip, which can make the flexibility of setting the service periods and the corresponding time-sharing service floors.	Group F21
19	Full selective	At auto run mode, elevator automatically response the up and down call button signal outside the hall.	
20	Up selective	At auto run mode, elevator automatically response the up call button signal outside the hall.	
21	Down selective	At auto run mode, elevator automatically response the down call button signal outside the hall.	
22	Separate wait	When in parallel and group control system the elevator is on the same floor of station, parallel and group control system will begin to separate wait, make the elevator run to the free floor.	Only parallel and group control systems
23	Peak service	In the setting peak time, if the car call from this peak floor is more than 3, then system enters into peak service. The car call is effective all the time, when the elevator is free, it will go to this floor.	
24	Real-time clock management	System has real-time clock chip to guarantee the clock work normal in 2 years.	

Standard Functions		Description	Remark
25	Shaft self-learning function	At the inspection mode, after start the shaft self-learning, the elevator runs from the lower limit toward the upper limit, to test door zone position of each floor and data of shaft switch position, and save.	
26	Full-load by pass	At auto run mode, when the car is full loaded (generally is 80% rated load), the elevator only responds to car calls but not the hall calls.	**Hall call LED:** Full-load indicator is lighting **Hall call LCD:** Display full-load mark
27	Over-load protection	When the load inside the car is over the rated load. The buzzer inside the car alarms, the over-load indicator is lighting, and the elevator keeps opening the door on the floor.	**Car call LED:** Display OL **Car call LCD:** Display full-load mark
28	Lighting and fan energy-saving function	When beyond the setting time and there is no car call and hall call, the elevator will automatically turn off the light and fan in car.	F23.01
29	Reverse cancelling	When elevator runs to the end floor or the direction is changed, system cancels all registered calls of the reverse directions.	F26.16 Bit15
30	Floor service set for front and back door	Based on the need to set the service floors for the front door and the back door.	F22.01 - F22.06
31	Door machine multi-mode operation	Parameter setting can be the door motor number, as well as the door motor service floor, door switch holding torque.	Group F22
32	Open-through door control mode	Support 4 open-through door control modes.	See 8.3.2
33	Open the door outside this hall	If the car stop at one floor, press the call button of this floor, the door will automatically open.	
34	OD button open the door	The elevator stopping at the door zone, you can re-press the OD button in the car to make elevator to re-open the closed or no-closed door.	
35	Auto open door at power up	Under normal circumstances, each time the elevator system is powered up, if the car is in the door zone, the car door will open automatically.	
36	Repetition of door closing	After the elevator continuing close the door for a certain time, if the door-lock has not been closed, the elevator opens the door automatically, and then repeats to close the door.	
37	Forced close door	In automatic state, the time of closing door lasts 60 seconds due to some reason, output the forced CD signal, the light curtain is invalid, and the buzzer sounds at the same time.	F26.13 = 1

Standard Functions		Description	Remark
38	CD button advanced close door	At auto run mode, pressing the CD button can cancel the door keep opening function, and after OD arrival, close the door immediately.	
39	Category setting for the time keeping door open	System can identify different time to keep the door open: car call to open the door, hall call to open the door, base station to open the door, delay to open the door.	
40	Keep open function	By pressing the keeping door open button, the elevator delay closing.	
41	Miss delete car command	In the car passengers can press the command button twice to eliminate the last error registered instruction.	F26.11
42	Floor display by any setting	Flexibly set the character displayed on each floor to meet the different display needs.	F24.01 - F24.48
43	Various hall data display formats	Outside the hall can set the scroll or fixed display, and the size of arrow.	F26.35, F26.36
44	Floor service setting	According to the needs can flexibly set the service floor of the elevator: close or activate one or more service floors and park landing.	
45	Car arrival chime	After the elevator arrives to the destination floor, the car top board will send the arrival chime signal.	
46	Outside approaching chime	After the elevator reaches the floor, through HCB it sends outside light arrival forecasting.	
47	Outside arrival chime	After the elevator reaches the floor, through HCB it sends outside clock arrival forecasting.	
48	Double hall call on the same floor	Double hall calls can be set when opposite doors are on the same floor.	
49	Hall call adhesion recognition	System can identify the adhesion situation of the hall call up/down buttons, automatically remove the call of the adhesion to avoid that the elevator can not be closed to run caused by the outside-call button adhesion.	Hall call adhesion button indiator flash
50	Weighing signal compensation	The system can use weighing signal to compensate the start of the elevator.	
51	Vice COP operation	The vice COP can be selected if the system has the main COP. The vice COP also equip with command button and door switch button, whose functions are the same with the main COP.	Additional car commond board (NL3000-CCB-A)

Standard Functions		Description	Remark
52	Car location automatically correct	1. When the elevator runs to the end station: The system will automatically check and rectify the car location information in accordance with the forced Dec. switch. If the position deviation is too large or speed is greater than the forced Dec. rate, it will decelerate at forced Dec. to avoid hoisting top and squatting bottom. 2. When the elevator runs to the leveling floor: Automatically correct in accordance with the present position and floor data of shaft parameter self-learning. If the deviation is too large, will decelerate to stop. At the same time, when return to the nearest leveling area, will open the door, the buzzer inside the car will alarm, after closing, elevator returns to the base station correction position at 0.200m/s.	
53	User calibration menu	Users can find the system parameters which are different from the factory parameters by this function.	F01.01 = 1
54	Earthquake control function	If the earthquake happens, earthquake detection devices act. The device has a contact signal input to the NL3000 system, the system will control the elevator stop at the nearest floor, after open the door, stop running.	
55	Current aslant remove	When use Syn. motor, after the elevator decelerate and stop, the maintaining current of the motor is removed by the slope way to avoid abnormal noise of the motor during the process.	F16.00
56	VIP service floor	When need VIP service, click the VIP switch and the elevator will carry out a VIP service operation: cancel all the registered command and call, the elevator straight run to VIP floor and open the door. The elevator can't close the door automatically and can't register the hall call but register the car call. Sustaining press the close button to make the door closed, the elevator straight to the destination floor, open the door and then the elevator turn to normal.	
57	Brake force detection	The brake force detection is an automatic detection function of the elevator control system for the brake brake force.	See 8.2.11

1.4 Optional Function Description

Optional Function		Description
1	IC card user management	Passengers must be licensed before they can reach the authorized floor.
2	Voice announcement	When the elevator is running, it will automatically broadcast the direction of running and the floor next reaching and other information to passengers.
3	Manipulator operation for handicapped persons	When the elevator waits in leveling position, if the registered call from handicapped person COP on this floor, then the time which the elevator keep the door open extending. similarly, if the door open after press the open button on handicapped person COP, the time is also extended.
4	Quarter monitoring	Through communication lines and control systems connect to the terminals installed in the control room to display the elevator location, direction, fault status and so on.
5	Phone debugging	Bluetooth module can be connected to the elevator through Android phone to debug, monitor, parameter download or upload.

1.5 Protection Function Description

Protection Function		Description
1	Fault history	The system can record 11 fault histories, including fault type, fault floor, fault time.
2	Over-speed protection	Ensure the car running speed in the security control areas, in order to ensure the safety of passengers and cargo.
3	Protection of excessive speed deviation	When detect that the speed deviation is too large, the system will protect itself automatically.
4	Encoder reverse protection	The system can judge the feedback signal direction of the rotary encoder, if is inconsistent with the given direction, it will carry out protection.
5	Encoder disconnection protection	The system can judge the feedback pulse of the rotary encoder, if encoder feedback signal is lost, it will carry out protection.
6	Door light curtain touching board protection	During the door is closing, the light curtain protection acts or the safe touching board act, the elevator will turn to open the door immediately. • Does not work in the fireman run and forced close door.
7	Non-open outside door zone	Prohibit from opening the door automatically when car is not in door zone.
8	Door fault protection	When detecting the elevator not yet close the door effective after the elevator open and close the door beyond the number set, system stop close and open the door switch and output the fault.
9	Protection of door-lock disconnect when running	When the door-lock disconnects during the elevator is running, the system will be automatic protection.
10	Door lock jump detected function	Detect that the door motor OD arrival signal and the door lock signal are valid at the same time, will carry out the door-lock short protection

Protection Function		Description
11	Next landing	If the elevator continue to open the door more than the time of open the door, the OD arrival signal has not yet been detected, the elevator would be turned into the closing door state, and after the door closed, automatically run the next registered floor. At the same time, elevator alarms the changed floor park fault.
12	Leveling switch fault protection	When the elevator is in the automatic running mode, it will identify the leveling signal loss and adhesion status.
13	Limit switch protection	If the up/down limit switch is action, the elevator ban running up/down, but can run to the opposite direction.
14	Anti-slip protection	At the non-inspection mode during the elevator running process, if the elevator continuous running time beyond the F23.02 set time (Max. 45s) and the leveling switch does not act yet, the system will regard this as detect the rope slip fault and stop all car running.
15	Contact protection of contactor	Brake contactor, output contactor, star-delta contactor and locked-door contactor etc feedback contact signals can be connected to the MCB board (MCB), the system will automatically judge whether the contactor is normal in accordance with the operating logic. • If find the abnormal contactor, then carry out protection.
16	Motor over-load protection	When detect the motor over-load, the system will be automatic protection.
17	Over-current protection	When detect that the motor's current value is greater than the Max. allowable, the system will be automatic protection.
18	Over-voltage protection	When detect that the voltage is greater than the Max. allowable value, the system will be automatic protection.
19	CPU overheated protection	When detect that the drive module is overheated, the system will be automatic protection.
20	Shaft self-learning fault protection	When the shaft self-learning has not been completed correctly, the system will alarm the shaft self-learning fault. • Without the right shaft data, the elevator will not be able to run.

Chapter 2

Safety Information and Precautions

2.1 Safety Definition


Danger

Danger: A Danger contains information which is critical for avoiding safety hazards.


Warning

Warning: A Warning contains information which is essential for avoiding a risk of damage to products or other equipements.

Note

Note: A Note contains information which helps to ensure correct operation of the product.

2.2 About Motor and Load

Motor's Overload Protecting Threshold

When choose the adaptive motor, the controller can effectively implement the motor thermal protection. Otherwise it must adjust the motor protection parameters or other protection measures to ensure that the motor is at a safe and reliable operation.

Lubrication of Mechanical Devices

At long time low-speed operation, it should provide periodical lubrication maintenance for the mechanical devices such as gear box and geared motor etc. to make sure the drive results meet the site need.

Frequent Start and Stop

It is recommended to use the control terminal to control the start and stop of the controller. It is strictly forbidden to use the switching device such as contactor to directly start and stop the operation on the input side of the controller, otherwise the equipment will be damaged.

Check the Insulation of the Motor

For the first time using of the motor or after long time storage, it need check the insulation of the motor to avoid damage the controller because of the worse insulation motor.

Note:

Please use a 500V Mega-Ohm-Meter to test and its insulation resistance must be higher than 5Mohm.

RCD Requirements of Leakage Current Protector

In operation the equipment will produce large leakage current which flows through the protective earthing conductor so that you should install type B of leakage protector RCD on the power supply side. When select the leakage current protector RCD, you must consider that the transient and steady-state earth leakage current may occur in equipment up and running, and choose the dedicated RCD with high harmonics measures, or a universal RCD for larger residual current.

Warning of Large Leakage Current to Ground

In operation the equipment will produce a large leakage current, before connecting the input power supply, it be reliably grounding. Equipment grounding must comply with relevant IEC standards of local regulations.

2.3 About Safety

No Capacitor or Varistor on the Output Side

Since NL3000 output is PWM wave, it is strictly forbidden to connect capacitor for improving the power factor or varistor for lightning protection to the output terminals so as to avoid NL3000 fault tripping or component damage.

Contactors and Circuit Breakers Connected to the Output

If circuit breaker or contactor needs to be connected between NL3000 and motor, be sure to operate these circuit breakers or contactor when NL3000 has no output, so as to avoid any damage to NL3000.

Rated Voltage

NL3000 is prohibited to be used beyond the specified range of operation voltage. If needed, please use the suitable voltage regulation device to change the voltage.

Capacitor Energy Storage

Where the AC power supply is cut off, the capacitors in the controller remain energized for a period of time and the voltage is sufficiently fatal. If the controller has been powered on before, the AC power must be cut off for more than 10 minutes, and the internal charging indicator has been extinguished. The voltage between terminals (+) and (-) is lower than 36V.

Typically, internal circuitry discharges the capacitor. However, under certain abnormal conditions, the capacitor may not discharge. In this case, please consult our company or distributor.

Change Three phase Input Into Single Phase Input

For three phase input controller, the users should not change it to be single phase input.

If you have to use single phase power supply, you should set F17.00 (the detect base of lack of input) as 0%. And the bus-voltage and current ripple will increase, which not only influences the life of electrolytic capacitor but also deteriorates the performance of NL3000.

In that case, the controller must be derating and should be within the controller 60% rated value.

Lightning Surge Protection

NL3000 internal design has lightning surge overcurrent protection circuit, and has certain self-protection capacity against the lightning.

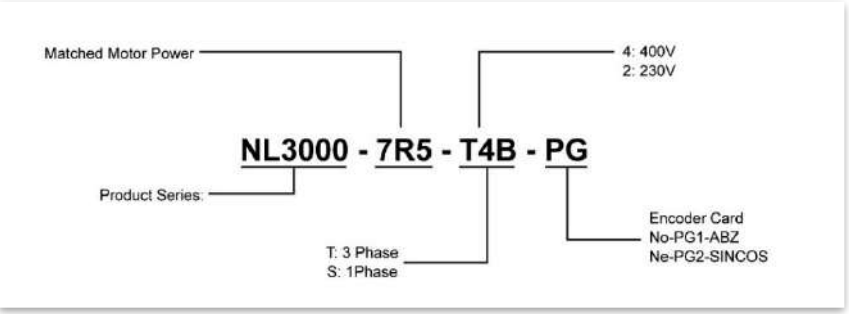
Altitude and Derating

In the altitude exceeded 2000 meters area, since the heatsink efficiency will be reduced because of the tenuous air, NL3000 should be derated. For every 100m rise in altitude, the output current rating is reduced by 1%. That is, the altitude rises to 3000m, and the controller current rating is derated by 20%.

Chapter 3

Product Information

3.1 Model Description



3.2 Nameplate

The nameplate is located on NL3000 right side.

Elevator Interated Controller

MODEL: NL3000-5R5R4B

POWER: 5.5KW

Input: 3ph ac 380-460v 15a 50hZ/60hz

Output: 3ph ac 0-460v 14a 0/100hz

Version: /

Let the drive connect the world

3.3 Ratings

Structure size see section3.5 Dimensions and Weight, page 23.

Size	Model	Motor (kW)	Rated Capacity (kVA)	Rated Input Current (A)	Rated Output Current {A)
Single phase power supply: 200 - 240V, 50/60Hz					
(1): Value before / is for single phase model, value after / is for three phase model.					
Three phase/1 Phase power supply:200 - 240V, 50/60Hz					
FA	NL3000-3R7T2B	3.7	5.9	19	17
FA	NL3000-5R5T2B	5.5	8.5	29	27
FA	NL3000-7R5T2B	7.5	11	35	33
Note: *If the three phase 220V controller is used in the European region, it is necessary to add a 400V to 220V step-down transformer. The capacity of the step-down transformer needs to be 3 times greater than the rated capacity of the controller.*					
Three phase power supply: 380 - 460V, 50/60Hz					
FA	NL3000-2R2T4B	2.2	3.4	7.3	5.1
FA	NL3000-3R7T4B	3.7	5.9	11.9	9
FA	NL3000-5R5T4B	5.5	8.5	15	13
FA	NL3000-7R5T4B	7.5	11	20	18
FA	NL3000-011RT4B	11	16	29	27
FA	NL3000-015RT4B	15	21	35	33
FB	NL3000-018RT4B	18.5	24	41	39
FB	NL3000-022RT4B	22	30	50	48
FB	NL3000-030RT4B	30	39	62	60

Note:

Here only lists the standard NL3000 models.

Other detailed parameters of power class of products are not listed here because on-site use is less.

If you need these products, please contact with us directly.

3.4 Specifications

Electrical	
Input voltage	Single/three phase: 200 - 240V, 50/60Hz Three phase: 380 - 460V, 50/60Hz Fluctuation within ± 10%, imbalance rate < 3%
Input frequency	50/60Hz ± 5%
Output voltage	0V - Input voltage
Output frequency	0.00 - 100.00Hz

Performance	
Max. current	150% rated output current for 2 minutes, 180% rated output current for 10 seconds
Control mode	Closed-loop vector control (VC)
Operation command control mode	Keypad control. Terminal distance control
Speed control accuracy	± 0.05%
Speed control range	1: 1000
Torque control response	< 50ms
Start torque	200% rated torque /0Hz
Carrier frequency	1 - 16k, Carrier frequency can be adjusted automatically in accordance with the load characteristic
Characteristic	
Maximum floor	48 floors
Maximum run speed	4 m/s
Group control number	Up to 8
Communication mode	CAN communication, Modbus communication
Basic Protection	
Parameter upload and download function	Can achieve parameter upload or download
Motor auto-tuning	Auto-tuning with load free off load
Distance control	Distance control with direct stop
Start weighing compensation	Support many weighing compensations
Acc. / Dec. curve	Can set Acc. / Dec. curve parameter and auto select optimal speed in accordance with floor distance
Shaft self-learning	Using 32-bit data can record the shaft position accurately
Re-leveling	Support OD re-leveling and advanced open door
Real-time clock	Based on accurate real-time clock, it can accomplish time-sharing service, fault time record etc.
Fault protection	Provide up to 70 kinds of protection such as short circuit protection, I/O lack phase protection, over-current protection, elevator over-speed, excessive speed deviation, door motor fault, encoder disconnection, and encoder reverse etc. A complete elevator fault-dealing system
State display	Can easily monitor a variety of I/O signals of MCB and CTB board via keypad

I/O Feature	
Digital input	24 digital input terminals, specifications are 24V and 5mA
High voltage input	3 high voltage input terminals, specifications are 110 - 220VAC/DC
Analogue input	Analogue voltage input (-10 - 10V)
Communication terminal	Car top board (CTB) communication, hall call board (HCB) communication, parallel group control communication
Programmable relay output	6 relay outputs
Encoder interface	The optional encoder card can be adapted to different types of encoder
Operation and Monitoring	
LED display	Function parameter setting, state parameter check, fault code check etc.
Small keypad	5-bit LED, can achieve part of the debugging features
Host computer	Parameter settings and upload and download fault inquiries, call and curve monitoring etc.
Cell phone	Debugging via Android phone
Environment	
Operation temperature	-10 - +40℃, Max. allowed temperature is 50℃ and air temperature fluctuation is less than 0.5℃/min The derating value of the output current shall be 2% for each degree centigrade above 40 - 50℃
Storage temperature	-40 - +70℃
Location for use	Indoor, preventing from direct sunlight, no dust, corrosive, flammable gases, oil mist, water vapor, dripping or salt etc.
Altitude	Less than 2000 meters, otherwise should be derating use
Humidity	Less than 95%RH, non-condensing
Oscillation	3.5m/s^2 at 2 - 9Hz, 10m/s^2 at 9 - 100Hz (IEC 60721-3-3)
Protection rank	IP20
Pollution rank	2 (dry, non-conductive dust pollution)
Options	
Encoder card	ABZ incremental encoder card (NL-PG1-ABZ) SINCOS encoder card (NL-PG2-SINCOS)
Installed components	0.5 / 3 / 6m connected cable of CCB and CCB (NL-CCL 3M
About keypad	NL-LED

3.5 Dimensions and Weight

.

Table 3-1 NL3000 size and gross weight

Size	Dimension (mm)		Mounting Size (mm)				GW
	W	H	W1	H1	D	Aperture d	(kg)
FA	200	320	200	344.5	165	6.5	7
FB	260	460	260	460	245	6.5	15

Note:

Due to elevator on-site use of other power class products are less, some detail parameters are not listed. If you need this type product, please contact our company.

Chapter 4

Control System Introduction

4.1 Control System and Precautions

NL3000 system configuration diagram is shown in Figure 4-1.

Figure 4-1 NL3000 controlling system configuration

Danger

- The control circuit is basically insulated with the power circuit. Do not touch the control circuit when the controller is on power.

Warning

- If the control circuit is connected to the external devices with live touchable port, it should increase an additional isolating barrier to ensure that classification of external devices may not be changed.
- If connect the communication terminal of the control circuit to the PC, you should choose the RS485/232 isolating converter which meets the safety requirement.
- NL3000 provides automatic restart. Please check the peripheral device and motor connecting carefully before power the drive, to avoid damage.

4.2 Main Control Board (NL3000-MCB-A)

The main control board (NL3000-MCB-A) is the core of the control system and using the industry leading 32-bit DSP as the control core, which completes high-performance motor vector control, communicates with CTB (car top board), HCB (hall call board) and GCB (group control board), and achieves signal I/O processing and elevator logic control.

Figure 4-2 NL3000-MCB-A

4.2.1 Indicator Description

Table 4-1 Indicator description

Indicator		Description
RUN	Elevator operation indicator	Flashing at run. lighting at stop
COP	CTB CAN communication indicator	Flashing at normal communication. extinguishing at abnormal
GROUP	GCB CAN communication indicator	Flashing at normal communication. extinguishing at abnormal

Indicator		Description
HOP	HCB Modbus communication indicator	Flashing at normal communication. extinguishing at abnormal
Safe	Safety circuit indicator	Lighting at safety circuit closing. extinguishing at disconnection
LOCK	Locked-door circuit indicator	Lighting at locked-door circuit closing. extinguishing at disconnection
INS	Inspection indicator	Lighting at elevator inspection state. extinguishing at other states
Error	Fault indicator	Lighting at serious fault, flashing at general fault. extinguishing at no fault

4.2.2 Terminal Description

Table 4-2 Terminal Description

MCB terminals		Terminals description
X1 - X24	Digital input	Total 24 groups, programmable bipolar optional optocoupler-isolated input signals Input voltage: 0 - 30VDC. Input impedance: 4.7kΩ
X25 - X28, XCM_H	High voltage input terminal	Optocoupler-isolated input signals Input voltage: 110 - 220VAC/DC. Input impedance: 22kΩ • The function is set by F12.25 - F12.27
AI, GND	Analogue input	Input voltage range: -10 - 10V. Input impedance: 34kΩ
Y1 - Y6	Relay contact NO output	Programmable output, the functions is set by F12.28-F12.33 Y1 - Y3 Contact capacity: 250VAC/3A or 30VDC/1A Y4 - Y6 Contact capacity: 250VAC/3A or 30VDC/1A
CM1 - CM6	Common terminal of relay output	
+24V, COM	+24V power supply	External DC 24V power input, as I/O circuits and communication circuit power
MOD+, MOD-	Modbus communication	For Modbus communicating with hall call (NL3000-HCB-*) • Recommended to use shielded twisted pair
CAN1+, CAN1-	CAN communication	For CAN communicating with CTB (NL3000-CTB-A) • Recommended to use shielded twisted pair
GND	Communication ground	
CN3	RJ45	Modbus communication terminals, extensional keypads, check, modify MCB parameter
CN11	USB interface	Connect Bluetooth module (NL3000-BLE-A)
STO+, STO-	STO	STO input
+12V, COM	+12V power supply	Emergency power input

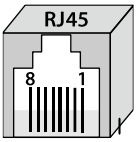
Note:

1. Relay must be controlled within 3A when its terminals are connected with AC 220V voltage signals.

2. RJ45 can not be with USB together, otherwise, NL3000 will be damaged.

3. Bluetooth can not be used as U flaseh disk. It can not plug into PC USB interface.

4.2.3 Modbus Communication Terminals Description



PIN	4	3	5	7
Definition	+5V	MOD+	GND	MOD-

4.2.4 Small Keypad Description

Keypad Description,5 digits small keyad synchronize the external keypad, which can be used as a normal keypad.

We can set all the para setting via this 5-digit keypad, no extra keypad required if our site egnieer is familiar with this function.

E50 sub error

- In case of failure in the system (originally no fault), the digital tube alternate display automatically switches from the fault code to F0 data menu. If the fault disappears automatically, it will enter F0 menu.
- Fault sub-code displaying when shaft learning: If the E50 shows in shaft self-learning, the keypad alternately displays "E50" and "bxx", where xx represents the fault code, and its meaning is as follows:

Fault Sub-code and Its Meanings		Fault Sub-code and Its Meanings	
b01	When the upper limit switch is activated, the current floor is not the highest floor	b02	After the completion of shaft self- learning, the upper limit switch is not action
b03	When starting self-learning, the current running direction is down	b04	Start self-learning, the next forced slowdown switch is not action
b05	Start self-learning, the current floor is not the first floor	b06	Starting the self-learning, the current control mode F00.01 is not closed loop vector control
b07	When the current floor is the highest level, the up forced Dec. switch 1 is not actuated	b08	distance from shaft self-learning to down forced Dec. switch 1 is 0
b09	distance from shaft self-learning to up forced Dec. switch 1 is 0	b10	distance from shaft self-learning to down forced Dec. switch 2 is 0
b11	distance from shaft self-learning to up forced Dec. switch 2 is 0	b12	distance from shaft self-learning to down forced Dec. switch 3 is 0
b13	distance from shaft self-learning to up forced Dec. switch 3 is 0	b14	shaft self-learning to down forced Dec. switch 2 and lower than the down forced Dec. switch1
b15	shaft self-learning to down forced Dec. switch 2 and higher than the down forced Dec. switch1	b16	shaft self-learning to down forced Dec. switch 3 and lower than the down forced Dec. switch2
b17	shaft self-learning to up forced Dec. switch 3 and higher than the upforced Dec. switch2	b18	When the forced switch is active, the current floor area is not the highest floor
b19	the learned distance of inseting board exceeds 50CM	b20	Self - learning data overflow 1
b21	Self - learning data overflow 2	b22	Total height of floors are less than 50cm
b23	Remove inspection order during Self-learning	b24	In self-learning, angle self-learning not be done for Syn. motor
b25	Two floors, starting self-learning, down leveling switch is in inserting board (normally should be under leveling inserting board)	b26	When starting self-learning, the upper limit switch is active
b27	when start shaft self-learning, the upper forced Dec. switch is active	b28	distance of lower forced Dec. switch is higher than the upper forced Dec. switch

4.2.5 Terminal Connection

Analog input signal is the weak signal, vulnerable to external interference, so not more than 50m of the shielded cable should be used in wiring,

And the shield is reliably grounded. In some cases where the interference is more serious, the analog input signal to be added by filter capacitor or ferrite ring.

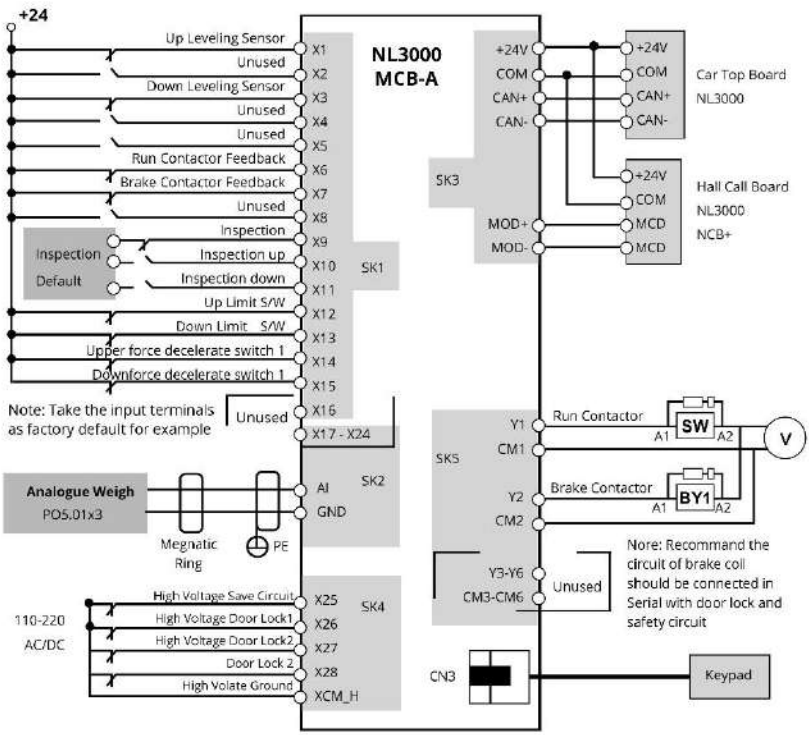


Figure 4-3 MCB wiring

Note:

When the factory parameters can not meet some field applications, you can set the input and output terminals corresponding functions, please refer to group F12.

4.3 Car Top Board (NL3000-CTB-B)

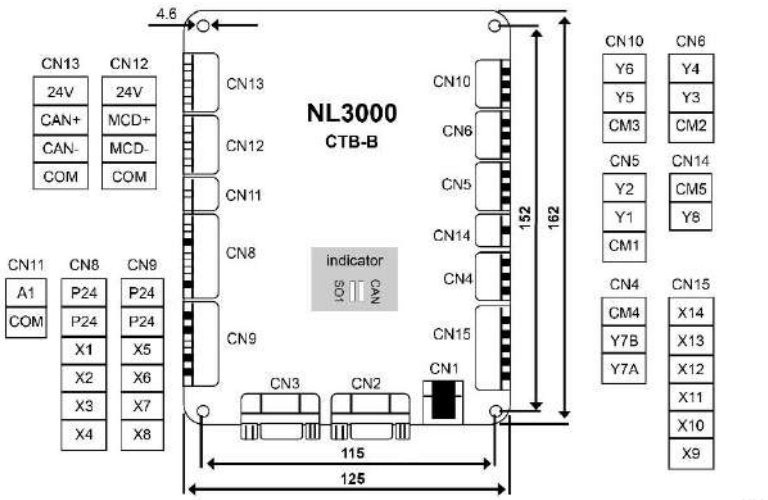


Figure 4-4 NL3000-CTB-B

Terminals Description

Table 4-3 Terminals description

Terminals		Description
24V, COM	+24V power supply	External provide +24V power, as the CTB power supply
CAN+, CAN-	CAN communication	CAN communication is used with NL3000-MCB-A
MOD+, MOD-	Modbus communication	Modbus communication is used with NL3000-HCB-*
AI, COM	Analogue input	Input voltage range: 0 - 10V. Input impendance: 34kΩ
X1 – X14	Digital input	Programmable unipolar input signal Input voltage range: 0 - 30VDC. Input impendance: 4.7kΩ • Function set by: X1 - X8 (F13.01 - F13.08), X9 - X14 (F26.08)
P24	+24V power supply	As digital input common terminal
Y1 - Y8	Relay contact output	Programmable output, the function is set by F13.25 - F13.31 • Y1 - Y6 contact rating: 250VAC/5A or 30VDC/5A • Y7A NC, contact rating: 250VAC/3A or 30VDC/3A • Y7B NO, contact rating: 250VAC/5A or 30VDC/5A • Y8 fixed function: Bypass running output
CM1 - CM5	Relay NO output	
CN2, CN3	CCB communication	CN2 communicates with CCB of main COP. CN3 communicates with CCB of vice COP • Refer to section 4.4 Car Command Board (NL3000-CCB-A)
CN1	Modbus communication	The optional keypad can check and modify the parameters of the MCB board (NL3000-MCB-A)
Note: *If relay terminal is connected to the AC 220V voltage signal, must be limited to within 3A.*		

Terminal Connection

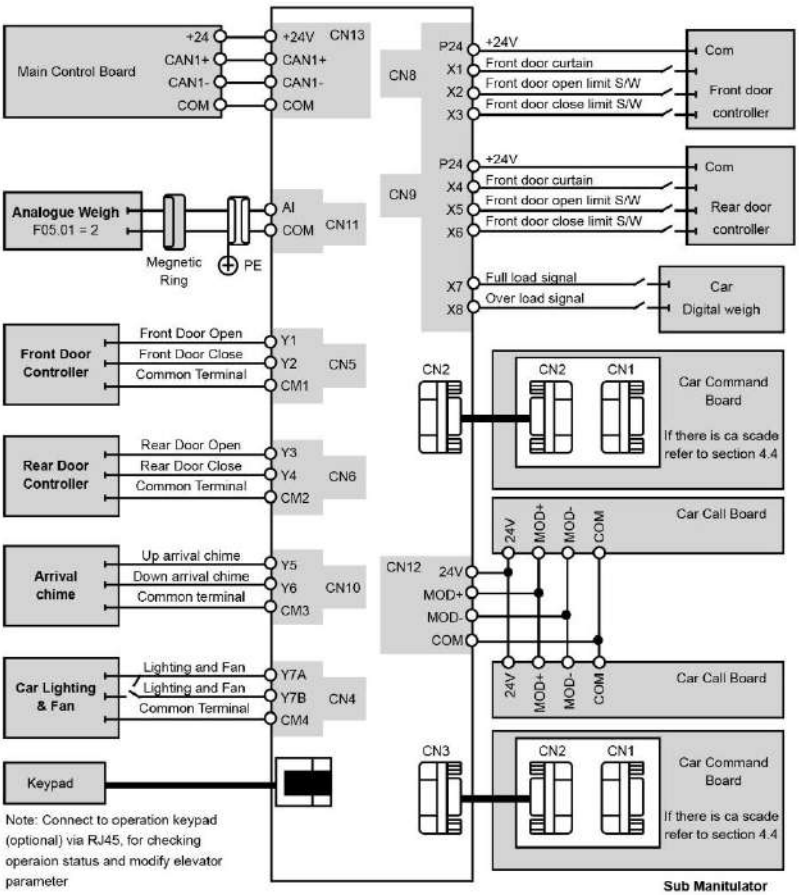


Figure 4-5 CTB connection

If the system is equipped with light curtain and touch board at the same time, there are two methods for achieving protection.

- Respectively connected the light curtain and the touch board to the input terminals of the CTB and set the corresponding function parameters.
- Use series or parallel method to send the light curtain and the touch board signals to an input terminal. If the two signals are NC, use series method. If the two signals are NO, use parallel method.

Indicator Description

Indicator	Description
CAN	CAN communication indicator with MCB, evenly flashing at normal communication.
SCI	Modbus communiation indicator with hall call board, evenly flashing at normal communication.

4.4 Car Command Board (NL3000-CCB-A)

Car command board (NL3000-CCB-A) is command board equipped with CTB (NL3000-CTB-B) in NL3000.

48 floors can be achieved by cascade, and achieve main and vice control box in parallel.

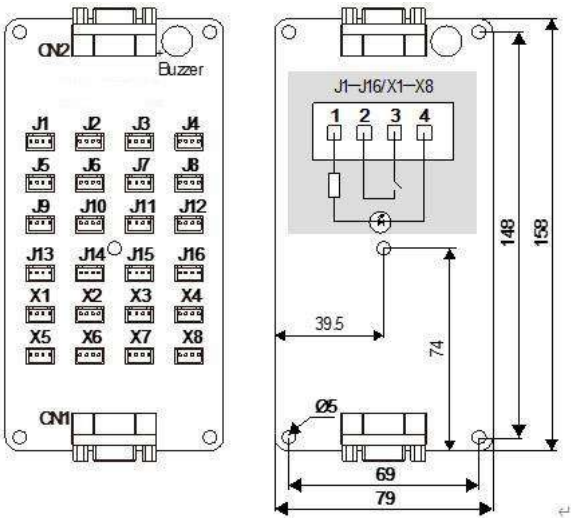


Figure 4-6 NL3000-CCB-A

J1 - J16 and X1 - X8 are mainly used for the acquisition of button commands and the output of the button command lights.

J1 - J16

Fixed-floor button interfaces are corresponding to intputs and outputs of floor 1 - 16.

- If two CCB are cascade, the second CCB is corresponding to I/O of floor 16 + N;
- If three CCB are cascade, the third CCB is corresponding to I/O of floor 32 + N.

X1 - X8

X1 - X8 can be customized:

- F13.09 - F13.16 (main COP input), F13.17 - F13.24 (vice COP input).
- F13.32 - F13.39 (main COP output), F13.40 - F13.47 (vice COP output).

Only the X1 - X8 interface of the command board 1 is valid when cascading.

Table 4-4 Main COP X1 - X8 input and output definition (factory value)

X1 - X8	Input Definition (Factory Setting)	Output Definition (Factory Setting)
X1	F13.09 = 9: OD button NO input	F13.32 = 10: OD button display input
X2	F13.10 = 10: CD button NO input	F13.33 = 11: CD button display input
X3	F13.11 = 11: Open door delay button NO input	F13.34 = 12: Open door delay button display output
X4	F13.12 = 12: Direct arrival signal NO input	F13.35 = 13: Full load signal output
X5	F13.13 = 13: Driver signal NO input	F13.36 = 14: Driver run signal output
X6	F13.14 = 14: direction changing signal NO input	F13.37 = 15: Driver direction signal output
X7	F13.15 = 15: Isolated run signal NO input	F13.38 = 16: Isolated run display output
X8	F13.16 = 16: Fireman switch nNO input	F13.39 = 17: Fire run display output

4.5 Display Control Board

The display control board is one of the important interfaces of interaction of NL3000 and user.

The display control board is divided into two kinds according to installations:

- Installing outside the car refers the hall call board (HCB).
- Installing inside the car refers the car call board.

Effect

Hall call board: Receiving information outside the car, such as user summon, display where elevator it is, and running direction information.

Car call board: Display information, such as elevator floor and running direction etc.

4.5.1 NL3000-HCB-L

Overview:

1. Size: 76 × 130mm.
2. DC24V power supply, Modbus communication protocol.
3. Vertical display, LCD (White on blue)display elevator running direction and the current floor.Horizontal is optional.
4. Indicators support overload, full load, stop, fault, maintenance and other status display.

Dimension (mm)

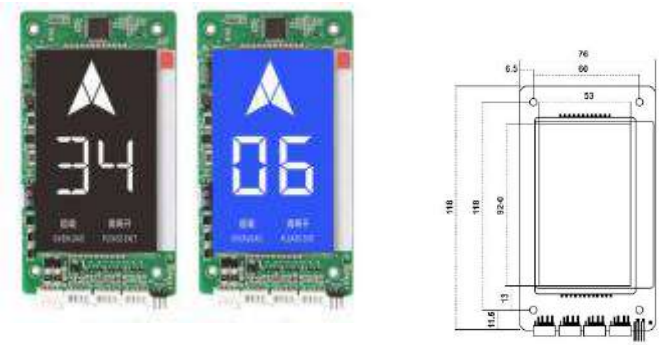


Figure 4-7 NL3000-HCB-L

T

4.5.2 NL3000-HCB-L5

overview

1. Size: 134 × 56mm.
2. DC24V power supply, Modbus communication protocol.
3. Vertical Dotmatrix display,Horizontal is optional
4. Indicators support overload, full load, stop, fault, maintenance and other status display.
5. Support keypad to modify and view parameters in the car.

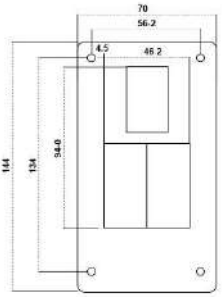


Figure 4-8 NL3000-HCB-L5

4.5.3 NL3000-HCB-LG

Overview

1. Size: 60 × 118mm.
2. DC24V power input, Modbus communication protocol.
3. Vertical display, colorful display elevator running direction and the current floor.
4. Ultra-thin 12mm design, suitable for wall-mounted call box.

Dimension (mm)

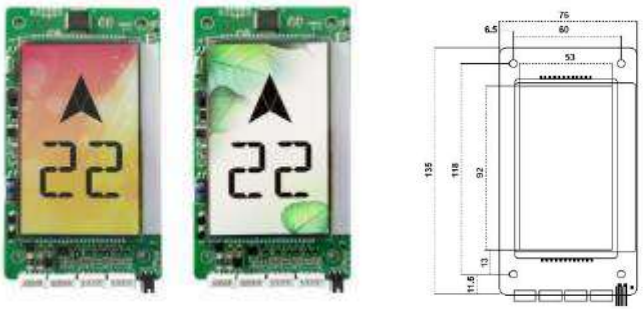


Figure 4-9 NL3000–HCB-LG

Terminals Description

Table 4-5 Terminals description

Terminals		Description
UP	Up call input	Pin 1, 2 are for 24V power supply, pin 3 is for up/down button input, pin 4 is for button lamp output
DOWN	Down call input	
LOCK	Locked-elevator input	pin 1, 2 are for locked-elevator switch input; pin 3, 4 are for fire-fighting input
FIRE	Firefighting intput	
CN2	power supply communication terminals	Pin 1 is as 1+24V, pin 2 is as 2MOD+, pin 3 is as MOD-, pin4 is as COM

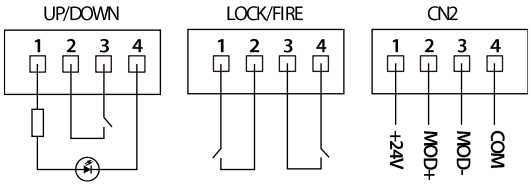


Figure 4-10 terminas definition

CN3 Set Floor Address

See section 8.2.6 Check before High Speed, page 163.

1. Short the floor set jumper, the floor display starts flashing, pull out the short wiring, until the floor display does not flash, you can use the uplink / down link button to modify the floor address.

2. Set the required floor, wait for 5s, the floor began to flash again, this time that the call address set successfully, flashing 3s, return to normal display state.

Encoder Card

4.5.4 Encoder Card Selection

NL3000 provide four kind encoder cards (optional).

Table 4-6 Encoder extensional card

Encoder Card	Function
NL-PG1-ABZ	• Support differential, OC push-pull signal input and pulse output • Apply to Asyn. motor close-loop vector control (VC)
NL-PG2-SINCOS	• Support sine and cosine signal input. support pulse output • Apply to Syn. motor close-loop vector control (VC)

Wiring Requirement of Encoder Card

- Encoder card wire should be laid separately and kept distance from power cables and forbidden to parallel with them.
- Encoder card wire should be shield wire, and shield layer should connect to PE near controller. (In order to avoid being disturbed, only one terminal connects to ground).
- Encoder card wire should be pulled on pipe separately, and metal crust should be connected to ground reliably.

4.5.5 NL3000-PG1-ABZ

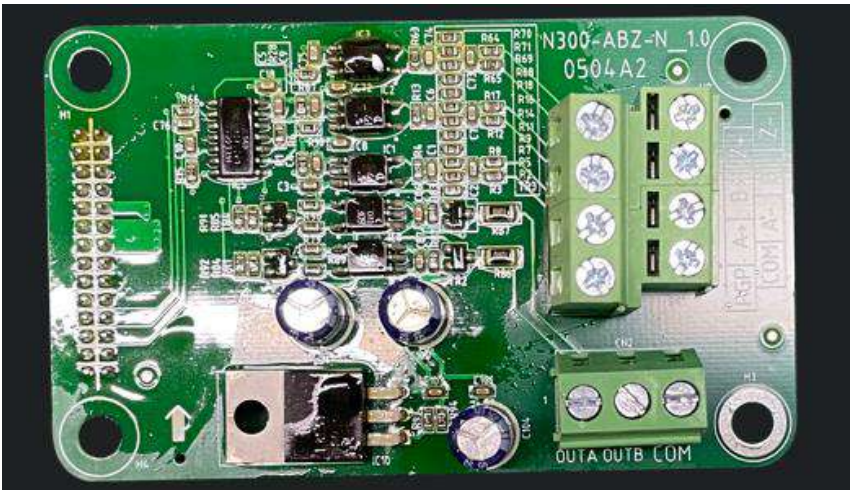


Figure 4-11 NL-PG1-ABZ

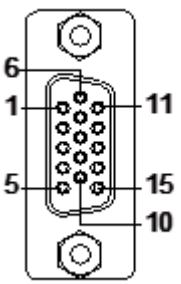
Terminals Description

Table 4-7 Terminals description

Terminal	Description	Terminal	Description
PGP	+12V power supply output	Z+ / Z-	Z+ / Z- signals of encoder
COM	Power ground, isolated from GND	OUTA	Output A signal, the output type is OC output
A+ / A-	A+ / A- signals of encoder	OUTB	Output B signal, the output type is OC output
B+ / B-	B+ / B- signals of encoder	COM	Output ground, isolated from GND

4.5.6 NL-PG2-SINCOS

Figure 4-12 NL-PG2-SINCOS



Terminals Description

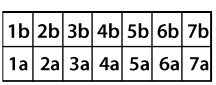
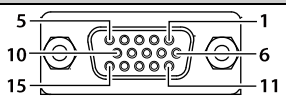
Table 4-8 DB15 connection terminal signal and FD description

Terminal		Description	Terminal		Description
1 / 8	B- / B+	Differential signal B- / B+	12 / 13	D+ / D-	Differential signal D+ / D-
3 / 4	R+ / R-	Differential signal R+ / R-	2 / 14 / 15		Invalid
5 / 6	A+ / A-	Differential signal A+ / A-	OUTA		Output signal A /B, output type is OC output
7	PGGND	Power supply ground	OUTB		
9	PGVCC	+5V power supply	COM		Output signal site, isolated from GND
10 / 11	C+ / C-	Differential signal C+ / C-			

Encoder Card Wiring

We recommend HEIDENHAIN ERN1387 encoder for use. 1387 double-socket and DB15 connection terminal are shown as Table 4-9.

Table 4-9 1387 double-socket and DB15 terminal relation

1387 double-socket		DB15 terminal	
			
5a	B-	1	B-
4b	R+(Z+)	3	R+
4a	R-(Z-)	4	R-
6b	A+	5	A+
2a	A-	6	A-
3a+5b	0V	7	PGGND
3b	B+	8	B+
7a+1b	5V	9	PGVCC
7b	C+(SIN-)	10	C+
1a	C-(SIN+)	11	C-
2b	D+(COS+)	12	D+
6a	D-(COS-)	13	D-

Note:

The signal phase sequence of C+/C- and D+/D- in the parameter auto-tuning will automatically learn the wiring mode, and there is no special requirement for its wiring.

I.e. C+/C- can be exchanged for C-/C +, D+/D- can be exchanged for D+/D-.

Chapter 5 Installation and Wiring

5.1 Installation Precautions

Danger

- Do not install if NL3000 is imcomplete or impaired.
- Please see the controller size to take appropriate tools for handing, avoid harming from sharp edges or injured by a dropped controller.
- Make sure that NL3000 is far from the explosive and combustible things.
- After the NL3000 has been fully powered off for 10 minutes, make sure that the internal charge indicator has gone out and that the voltage between the power terminals (+) and (-) is less than 36V. the operation will be allowed.

Warning

- Do not play metal into NL3000 when installing.

5.2 Requirement for the Installation Site

Ensure the installation site meeting the following requirements:

- Do not install at the direct sunlight, moisture, water droplet location;
- Do not install at the combustible, explosive, corrosive gas and liquid location;
- Do not install at the oily dust, fiber and metal powder location;
- Be vertical installation on fire-retardant material with a strong support;
- Make sure adequate cooling space for NL3000 so as to keep the ambient temperature between - 10 - + 40℃;
- Install at where the vibration is 3.5m/s^2 in 2 - 9Hz, 10m/s^2 in 9 - 200Hz (IEC 60721-3-3);
- Install at where the humidity is less than 95%RH and non-condensing location;
- Protection level of NL3000 is IP00 and pollution level is 2 (dry, non-conducting dust pollution).

Note:

1. It needs derating use if operation temperature exceeds 40℃. The derating value shall be 2% for each degree centigrade. Max. allowed temperature is 50℃.

2. Keep ambient temperature between -10 - +40℃. It can improve operation performance if install at the location with good ventilation or cooling devices.

5.3 Wiring Precautions

Danger

- Only qualified electrical engineer can perform wiring job.
- Only when the power supply switch is completely off can you do the wiring job.
- You can't open NL3000 cover to do wiring operation until the power is cut-off 10 minutes later. Do not wire or detach NL3000 internal devices at power up situation.
- Check the wiring carefully before connecting emergency stop or safety circuit.
- The earth terminal PE of NL3000 must be reliable earthing. It must use two separate earth wire due to the leakage current from NL3000 to ground.
- It must use Type B mode when utilize earth leakage protection devices (ELCB/RCD).
- Do not touch the wire terminals of NL3000 when it is live. The main circuit terminals are neither allowed connecting to the enclosure nor short-circuiting.
- Bare metal parts of connections of high voltage input terminal (X25 - X28) and relay output terminal (Y1 - Y6) of MCB board must be wrapped with insulating tape.

Warning

- Do not do dielectric strength test on NL3000.
- Do wiring connection of the braking resistor according to the wiring figure.
- Make sure the terminals are fixed tightly.
- Do not connect the AC power cable to the output terminals U/V/W.
- Do not connect the phase-shifting capacitors to the output circuit.
- NL3000 DC bus terminals must not be short-circuited.

5.4 Selection of Peripheral Devices

5.4.1 Input and Output Wiring Specifications

The AC supply to NL3000 must be installed with suitable protection against overload and short-circuits, i.e. MCCB (molded case circuit breaker) or equivalent device.

The recommended specification of MCCB, contactor & cables are shown as Table 5-2.

The size of ground cable should accord with the requirement in 4.3.5.4 of IEC61800-5-1, as shown in Table 5-1.

Table 5-1 The cross-sectional area of the ground conductor

Sectional Area S of Phase Conductor (Power Cable) While Installing (mm^2)	S ≤ 2.5	2.5 < S ≤ 16	16 < S ≤ 35	S > 35
Min. Sectional Area Sp of Relative Protective Conductor (ground Cable) (mm^2)	2.5	S	16	S/2

Table 5-2 NL3000 I/O wiring specification

Model	MCCB (A)	Contactor (A)	Power Cable (mm^2)	Motor Cable (mm^2)	Ground Cable (mm^2)	Size
Single/three phase: 200 - 240V, 50/60Hz						
NL3000-2R2T2B	32 / 25(1)	20 / 16(1)	6 / 2.5(1)	2.5	6 / 2.5(1)	FA
NL3000-3R7T2B	63 / 40(1)	32	10 / 4(1)	4	10 / 4(1)	FA
NL3000-5R5T2B	125 / 63(1)	100 / 40(1)	25 / 6(1)	6	16 / 6(1)	FA
NL3000-7R5T2B	160 / 63(1)	100 / 40(1)	35 / 10(1)	10	16 / 10(1)	FA
(1): Value before / is for single phase model, value after / is for three phase model.						
Three phase: 380 - 460V, 50/60Hz						
NL3000-2R2T4B	16	10	1.5	1	2.5	FA
NL3000-3R7T4B	25	16	2.5	1.5	2.5	FA
NL3000-5R5T4B	32	25	4	2.5	4	FA
NL3000-7R5T4B	40	32	4	4	4	FA
NL3000-011RT4B	63	40	6	6	6	FA
NL3000-015RT4B	63	40	10	10	10	FA
NL3000-018RT4B	100	63	16	10	16	FB
NL3000-022RT4B	100	63	16	16	16	FB
NL3000-030RT4B	125	100	25	25	16	FB

5

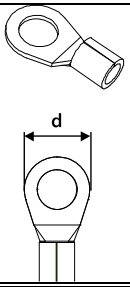
5.4.2 Power Terminals and Wiring Lugs

Select the lug of power terminal according to the size of terminal, screw size and max. outer diameter of lug. Refer to Table 5-3.

Take the round terminal as an example.

Table 5-3 Power terminals wiring lugs selections

Structure	Screws	Fasten Torque (N·m)	Max. Outside Diameter of the Lugs (mm)

FASM	M4	1.2 - 1.5	9.6	
FBSM	M4	1.2 - 1.5	10.2	
FA / FAR	M4	1.2 - 1.5	9.9	
FB / FBR	M5	2.5 - 3.0	12	
FC / FCSM / FDSM	M6	4.0 - 5.0	15.5	
FD	M8	9.0 - 10.0	24	

5.5 Power Terminal and Wiring

Danger

- The bare portions of the power cables must be bound with insulation tapes.

Warning

- Ensure that AC supply voltage is the same as NL3000 rated input voltage.

5.5.1 Power Terminals

Size FA

- R,S, T: Three phase AC power input terminals
- U, V, W: Output terminals, connect to three phase AC motor
- (+), (-): DC supply input terminals. DC input terminals of power regenerative unit
- (+), PB: Braking resistor connection terminals
- PE: Earth terminal, connect to the ground

5.6 Braking Resistor Selection

NL3000 has built-in energy consumption braking unit.

Table 5-4 Recommendated braking resistor selection

Model	Motor (kW)	Recommended Value(Ω)			Recommended Power (kW)	
		Min.	Max.	Recommended	Synchronous	Asynchronous
Single/three phase: 200 - 240V, 50/60Hz						
NL3000-2R2T2B	2.2	26	130	50	1	1
NL3000-3R7T2B	3.7	26	90	30	1.6	1.2
NL3000-5R5T2B	5.5	17	27	20	2	1.6
NL3000-7R5T2B	7.5	11	20	15	3.2	2
Three phase: 380 - 460V, 50/60Hz						
NL3000-2R2T4B	2.2	56	210	100	1	1
NL3000-3R7T4B	3.7	56	144	80	1.6	1.2
NL3000-5R5T4B	5.5	56	100	70	2	1.6
NL3000-7R5T4B	7.5	56	72	64	3.2	2
NL3000-011RT4B	11	34	48	40	4	3.2
NL3000-015RT4B	15	34	41	36	5	4
NL3000-018RT4B	18.5	17	31	24	6.4	5
NL3000-022RT4B	22	17	27	20	8	6.4
NL3000-030RT4B	30	11	20	15	10	8

Note:

1. Please select braking resistor based on the Table 5-4.
Bigger resistor can protect the braking system in fault condition, but oversized resistor may bring a capacity decrease, lead to over voltage protection.

2. The braking resistor should be mounted in a ventilated metal housing to prevent inadevertent contact during it works, for the temperature is high.

5.7 Installation of the Shaft Position Signal

In the elevator control, needing the shaft position signal to identify the car position can achieve the security of accurate stop and run.

The shaft position includes leveling signal, up/down forced Dec. switches, up/down limit switches, and up/down end limit switches, which are directly from the cable in the shaft conveyed to the MCB board of NL3000 controller.

In the shaft the position distributions of shaft position signals are shown as Figure 5-1.

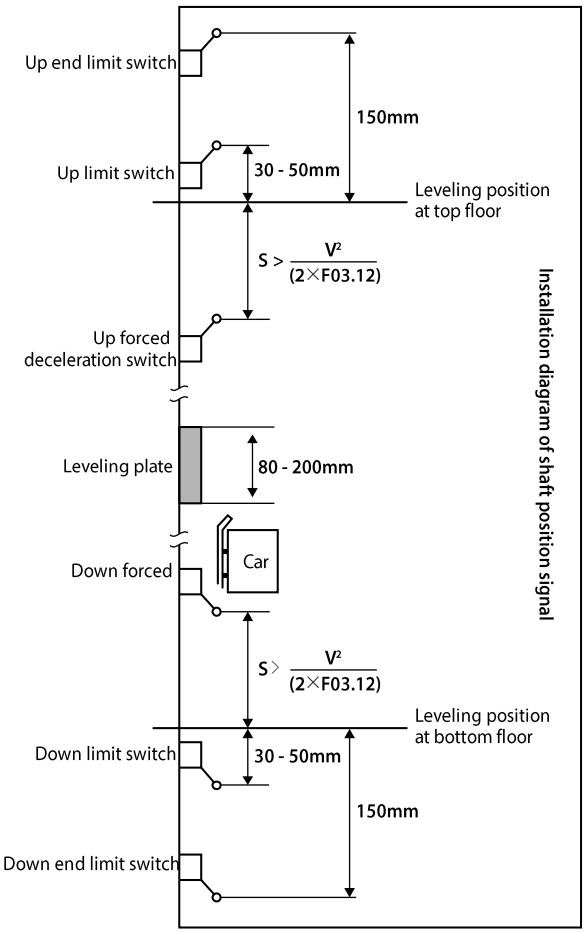


Figure 5-1 Installation Diagram of shaft position signals

5.7.1 Installation of the Leveling Signal

The leveling signal can make the car accurately stop on each floor, which is constituted by leveling switch and plate, and directly connected to the input terminals of NL3000 controller.

The leveling switch is usually installed above the car. NL3000 can install up to three leveling switches, shown as Figure 5-2.

The leveling plate is usually installed on the hoistway rail. Each floor is installed with one which is recommended to use a length of 80 - 200mm.

Note:

1. Before installing the leveling plate, make sure that length of isolated magnetic plate on each floor and the verticality of installation are consistent, otherwise it will affect the accuracy of floors.

2. When use the advanced open door function, it needs the leveling input signal and properly increases the length of leveling plate.

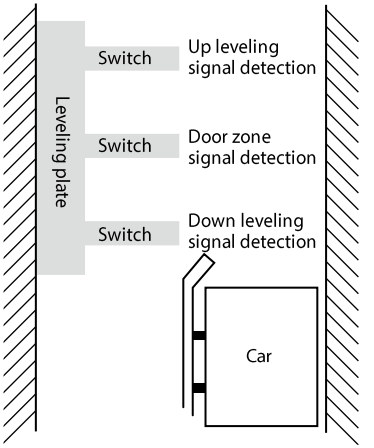
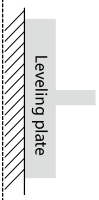
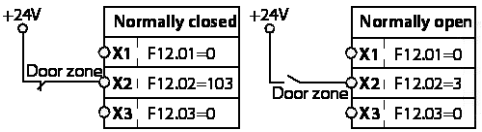
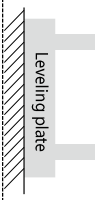
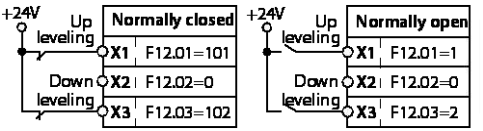
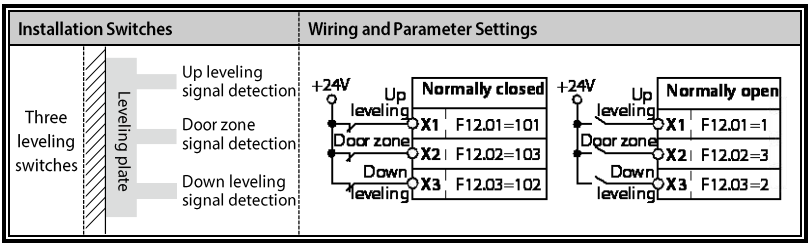


Figure 5-2 Installation diagram of leveling switches

Different leveling switches of installation, wiring and parameter settings are shown as Table 5-5.

Table 5-5 Leveling switch of installation, wiring and parameter settings

Installation Switches	Wiring and Parameter Settings
One leveling switch  	
Two leveling switches  	



5.7.2 Leveling Signal Installed with UCMP System

With UCMP protection system, the recommended leveling inserter and signals are shown in Figure 5-3.

Note:

1. Two re-leveling sensors must be used.

2. The leveling sensor must be installed in sequence, otherwise the direction will be reversed in re-leveling operation or opening the door in advance will be reversed.

3. The length of the barrier plate is determined by the actual door opening area (door length) of the elevator.

4. The length of the barrier plate and the installation of the leveling sensor will affect the effective distance of the UCMP output.

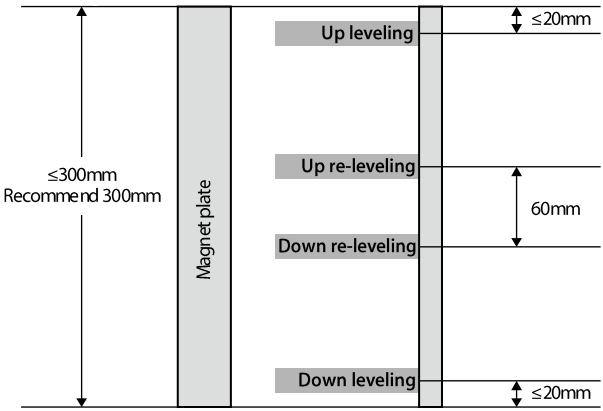


Figure 5-3 Recommended method for UCMP sensor installation

5.7.3 Installation of the Forced Dec. Switch

Forced Dec. switch is an importance means of protection for the elevator safety, in abnormal position of the elevator, which can guarantee that hoisting top or squatting bottom does not occur in the case of the Max. speed.

- **Elevator speed ≤ 1.75m/s**: Including installing up and down limit switch, only the first class forced switch needs to be installed;
- **1.75m/s < elevator speed ≤ 2.5m/s**: Including installing up and down limit switch, only the second class forced switch needs to be installed;
- **2.5m/s < elevator speed ≤ 4.0m/s**: Including installing up and down limit switch, only the third class forced switch needs to be installed;

5.7.4 Install Limit Switch

Limit switch is to prevent elevator impacting when elevator is not parked by going through end station level position.

- **Upper limit switch**: It is generally necessary to install it at a distance of 30-50 mm from the top layer. When the car is at the top layer level position, and then continue to go up for 30-50mm, the upper limit switch will act.
- **Lower limit switch**: It is generally required to be installed at a distance of 30-50 mm from the bottom floor. When the car is at the bottom layer position, and then continue to go down for 30-50mm, the lower limit switch will act.

If the system is equipped with upper and lower leveling switch, you can use the upper and lower forced Dec. switch and the upper and lower leveling switch to synthesize the upper and lower limit signal, cancel the physical limit switch. It is selected by Bit10 (upper and lower limit switch selection) of F26.16.

5.7.5 Install Terminal Limit Switch

Terminal limit switch is to prevent elevator impact when the elevator is not parked by going over the upper and lower limit switch

- **Upper terminal limit switch**: Mounted above the upper limit switch, typically 150mm from the top layer.
- **Lower terminal limit switch**: Mounted below the lower limit switch, typically 150mm from the bottom layer.

5.8 Meet EMC Requirement of Installation

5.8.1 Correct EMC Installation

According national standards GB/T 12668.3, NL3000 should meet the two requirements of electromagnetic interference (EMI) and anti-electromagnetic interference. The international standards IEC/61800-3 (VVVF drive system part 3: EMC specifications and test methods) are identical to the national standards GB/T 12668.3.

NL3000 are designed and produced according to the requirements of IEC/61800-3. Please install as per the description below so as to achieve good electromagnetic compatibility (EMC).

- In a drive system, NL3000, control equipment and sensors are installed in the same cabinet, the electromagnetic noise should be suppressed at the main connecting points with the EMI filter and input reactor installed in cabinet to satisfy the EMC requirements.
- The most effective but expensive measure to reduce the interference is to isolate the noise source and the noise receiver, which should be considered in mechanical system design phase. In driving system, the noise source can be NL3000, braking unit and contactor. Noise receiver can be automation equipment, encoder and sensor etc.

The mechanical/system is divided into different EMC areas according to its electrical characteristics. The recommended installation positions are shown in Figure 5-4.

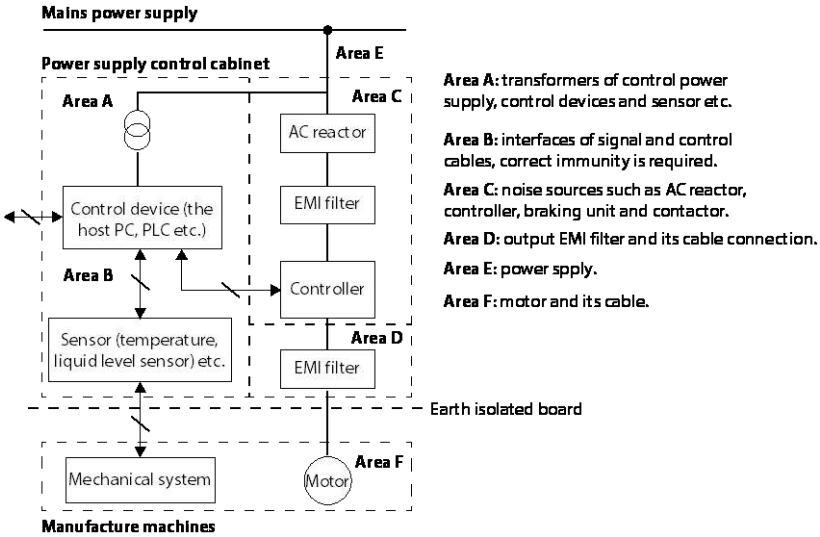


Figure 5-4 System wiring sketch

- All areas should be isolated in space to achieve electromagnetic decoupling effect.
- The minimum distance between areas should be 20cm, and use earthing bars for decoupling among areas, the cables from different area should be placed in different tubes.
- EMI filters should be installed at the interfaces between different areas if necessary.
- Bus cable (such as RS485) and signal cable must be shielded.

5.8.2 Wiring Requirement

In order to avoid interference intercoupling, it is recommended to separate the motor cables and the control cables from power power cables, and keep enough distance among the cables. Especially when the cables are laid in parallel and the cable length is long, the signal cables should cross the power power cables perpendicularly as shown in Figure 5-5.

Power cables, motor cable and control cables should be distributed in different pipelines.

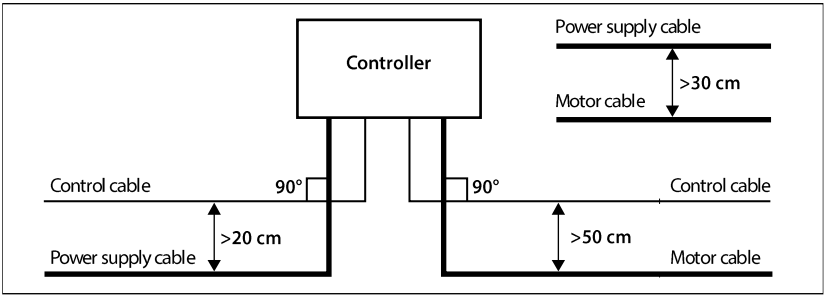


Figure 5-5 System wiring requirement

Shielded/armoured cable: High frequency low impedance shielded cable should be used. For example: copper net, aluminum net or iron net.

Normally, the control cables must use the shielded cables and the shielding metal net must be connected to NL3000 metal enclosure of the drive by cable clamps as shown in Figure 5-6.

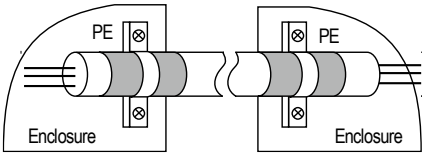


Figure 5-6 Correct connection of the shielded cable

5.8.3 Wiring Motor

Longer the cable between NL3000 and motor is, higher the high-frequency leakage current is, causing NL3000 output current to increase as well. This may affect peripheral devices.

When the cable between motor and NL3000 is longer than 100 meters, it is recommended to install output reactor and adjust the carrier frequency as per the instruction in Table 5-6.

Table 5-6 Carrier frequency and wiring distance between NL3000 and motor

NL3000 and Motor	< 30m	30 - 50m	50 - 100m	≥ 100m
Carrier Frequency	15kHz below	10kHz below	5kHz below	2kHz below

NL3000 should be derated if the motor cables are too long or their cross sectional area (CSA) is too large. NL3000 cables should be the cables with specified CSA (see Table 5-2) because the capacitance of the cable to ground is in proportional to the cable's CSA.

If the cable with big CSA is used, its current should be reduced. The current should be decreased by 5% when per level of CSA is increased.

5.8.4 Ground Connection

The grounding terminal PE must be connected to ground properly. The ground cable should be as short as possible (the grounding point should be as close to the controller as possible) and the grounding area should be as large as possible. The grounding resistance should be less than 10Ω.

Do not share the ground cable with other devices (A). NL3000 can share grounding pole with other devices (C). It achieves the best effect if NL3000 and other devices use dedicated grounding poles (B), as shown in Figure 5-7.

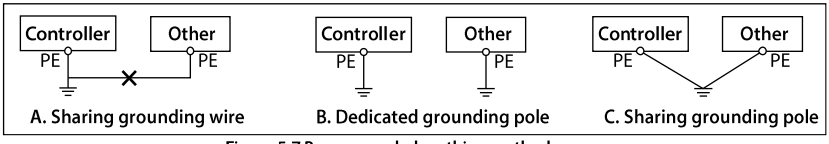


Figure 5-7 Recommended earthing method

When using more than two NL3000, be careful not to loop the ground cable as shown in Figure 5-8.

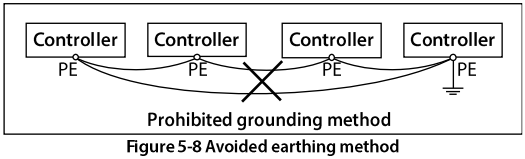


Figure 5-8 Avoided earthing method

5.8.5 EMI Filter

The EMI filter should be used in the equipment that may generate strong EMI or the equipment that is sensitive to the external EMI. The EMI filter should be a dual-way low pass filter through which lower frequency current can flow while higher frequency current can hardly flow.

Function of EMI filter

1. The EMI filter ensures the equipment not only can satisfy the conducting emission and conducting sensitivity in EMC standard but also can suppress the radiation of the equipment.

2. It can prevent the EMI generated by equipment from entering the power cable and the EMI generated by power cable from entering equipment.

Common mistakes in using EMI filter

1. Too long the power cable is between the EMI filter and NL3000

The filter inside the cabinet should be located near to the input power source. The length of filter power cables should be as short as possible.

2. Too close the input and output cables of the EMI filter

The distance between input and output cables of the filter should be as far apart as possible. Otherwise the high-frequency noise may be coupled between the cables and bypass the filter. Thus, the filter will become ineffective.

3. EMI filter bad earthing

The EMI filter's enclosure must be earthed properly to the metal case. In order to achieve better earthing effect, make use of a special earthing terminal on the filter's enclosure. If you use one cable to connect the filter to the case, the earthing is useless for high frequency interference. When the frequency is high, so is the impedance of cable, hence there is little bypass effect.

The correct installation: The EMI filter should be mounted on the enclosure of equipment. Ensure to clear away the insulation paint between the filter case and the enclosure for good earthing contact.

5.8.6 Conduction, Radiation and Radio Frequency Interference Countermeasures

NL3000 Radiation Emission

NL3000 operating theory means that some radiation and emission is unavoidable. NL3000 is usually installed in a metal cabinet which normally little affects the instruments outside the metal cabinet. The cables are the main radiation emission source. If connect the cables according to this manual, the radiation and emission can be suppressed effectively.

If NL3000 and other control equipment are installed in one cabinet, the area rule must be observed. Pay attention to the isolation between different areas, cable layout and shielding.

Reducing Conducted Interference

Please add a noise filter to suppress conducted interference on the output side. Additionally, conducted interference can be efficiently reduced by threading all the output cables through a grounded metal tube. And conducted interference can be dramatically decreased when the distance between the output cables and the signal cables is above 0.3m.

RF Interference Clearing

The I/O cables and NL3000 itself will produce radio frequency interference. A noise filter can be installed both on the input side and output side, and shield them with iron utensil to reduce RF interference. The wiring distance between NL3000 and motor should be as short as possible shown in Figure 5-9.

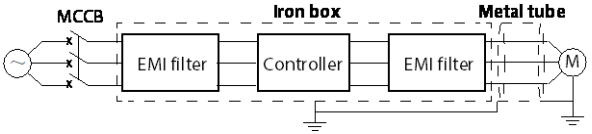


Figure 5-9 RF interference clearing

5.8.7 Input and Output Reactor

AC Input Reactor

The purpose of installing an AC input reactor is: to increase the input power factor. To dramatically reduce the harmonics on the input side at the high voltage point of common coupling and prevent input current unbalance which can be caused by the phase-to phase unbalance of the power supply. An AC line reactor which will help to protect the input rectifiers also reduces external line voltage spikes (for example the lightning!).

DC Reactor

The installation of a DC reactor can increase the input power factor, improve NL3000 overall efficiency and thermal stability, substantially eliminate the upper harmonics influence on NL3000 performance, and considerably decrease the conducted and radiated electromagnetic emissions from NL3000.

AC Output Reactor

Generally speaking, when the length of the cable between NL3000 and motor is more than 100m, it will cause leakage current and NL3000 tripping. It suggests that the user should consider installing an AC output reactor.

Chapter 6

Debugging Tools

Introduction

6.1 LED Keypad (NL-LED) and Bluetooth

NL3000 have optional Bluetooth;

Keypad (NL-LED).

See Table 6-1.

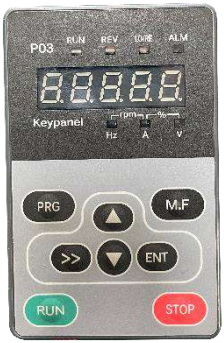


Table 6-1 Key description

Key	Function
PRG	Entry or exit programming key
ENT	• Enter lower menu • Confirm to save the data
RUN	• At keypad control (F00.07 = 0), to start NL3000 • At distance control (F00.07 = 1), equivalent to the open door (OD) button
STOP	• At keypad control (F00.07 = 0), to stop NL3000; • At distance control (F00.07 = 1), equivalent to the close door (CD) button; • At detecting fault and fault floor, to be as fault reset key
▲	Increment of data or parameter number
▼	Decrease rement of data or parameter number
▶	Select the data modification bit

Note:

If NL3000 does not have password, it will not display "input password interface" at power up.

6.1.1 Four-level Menu Description

The four level menus are: **mode setting (first-level)→function group setting (second-level)→ parameter setting (third-level)→setting parameter(fourth-level)**.

Figure 6-1 Four-level menu operation flowchart

Table 6-2 Key description on each level menu

Key	First-level Menu	Second-level Menu	Third-level Menu	Fourth-level Menu
PRG	Return to state display	Return to mode setting level	Return to function group setting level	No save present value and return to parameter setting level
ENT	Enter to function group setting level	Enter to function para. setting level	Enter to setting parameter level	Save present value and return to function para. setting level
▲	Select function group. Cycle according to D-F-Y	Modify function group. Increase 1 when press the key once	Modify function parameter. Increase 1 based on present modifiable bit	Modify parameter value. Increase 1 based on present modifiable bit
▼	Select function group. Cycle according to Y-F-D	Modify function group. Dec.rease by 1 when press the key once	Modify function para. Dec.rease 1 based on present modifiable bit	Modify parameter value. Dec.rease 1 based on present modified bit
▶	Invalid	Invalid	Switch tens and units	Cyclically switch parameter modifiable bit, long press can quickly switch

Elevator Monitoring

Bluetooth debugging tool

The smartphone interface is as below, it can show live curves on your smartphone as well.

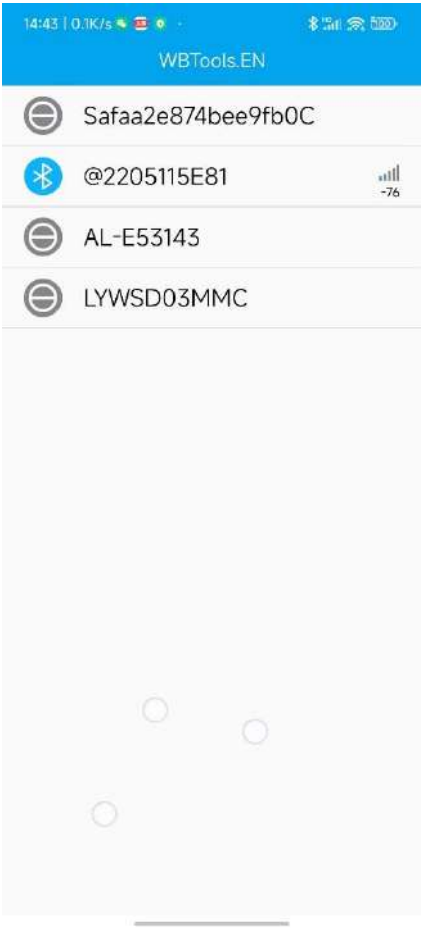


Table 6-1 Elevator monitor interface

Chapter 7

Function Parameter Introduction

Chapter 7
Function Parameter Introduction

This chapter will provide detail function introduction.

7.1 D: State Display Parameters

7.1.1 D00: Configurations of Integrated Controller Hardware and Software

D00.00	Controller series	[Actual value]
D00.01	Controller rated power	[Actual value]
D00.02	Controller rated current	[Actual value]

Note:

1. After replaces the MCB board (MCB), the factory Y00.01 (model parameter) is needed to be reset, and D00.01 and D00.02 automatically refresh.

2. D00.01 and D00.02 must be the same as NL3000 actual power and current, otherwise the NL3000 will run abnormal.

D00.03	Software version of MCB	[Actual value]
D00.04	Software version of CTB	[Actual value]
D00.05	Software version of HCB	[Actual value]
D00.06	Software version of keypad	[Actual value]
D00.07	Special software version of MCB	[Actual value]

Display the special software version of MCB (NL3000-MCB-A).

D00.08	Special software version of CTB	[Actual value]

Gisplay the special software version of CTB (NL3000-CTB-B).

D00.09	Special software version of HCB	[Actual value]

Display the special software version of HCB (NL3000-HCB-*).

7.1.2 D01: Display Parameters in Drive Stat

D01.00	S-curve preset speed	[Actual value]

Display the S-curve preset speed.

Display the Max. speed of the elevator at shutdown. display real-time preset speed at runtime.

D01.01	Elevator actual speed	[Actual value]
D01.02	Running RPM	[Actual value]
D01.03	Output voltage	[Actual value]
D01.04	Output current	[Actual value]
D01.05	Output frequency	[Actual value]
D01.06	DC bus voltage	[Actual value]

7.1.3 D02: Display Parameters of MCB Board

D02.00	MCB analogue input voltage	[Actual value]

Display the MCB (NL3000-MCB-A) analogue input voltage.

D02.01	MCB input IO state 1	[Actual value]

Display the MCB digital input terminals (X1 - X16) by a 16-bit binary, as following table:

Bit15: X16 terminal	Bit14: X15 terminal	Bit13: X14 terminal	Bit12: X13 terminal
Bit11: X12 terminal	Bit10: X11 terminal	Bit9: X10 terminal	Bit8: X9 terminal
Bit7: X8 terminal	Bit6: X7 terminal	Bit5: X6 terminal	Bit4: X5 terminal
Bit3: X4 terminal	Bit2: X3 terminal	Bit1: X2 terminal	Bit0: X1 terminal
• Bit0 - Bit15 set as 0: Terminal invalid		• Bit0 - Bit15 set as 1: Terminal valid	

D02.02	MCB input IO state 2	[Actual value]

Display the MCB digital input terminals (X17 - X27) by a 16-bit binary, as following table:

Bit15 - Bit12: Reserved			
Bit11: X28 terminal	Bit10: X27 terminal	Bit9: X26 terminal	Bit8: X25 terminal
Bit7: X24 terminal	Bit6: X23 terminal	Bit5: X22 terminal	Bit4: X21 terminal
Bit3: X20 terminal	Bit2: X19 terminal	Bit1: X18 terminal	Bit0: X17 terminal
• 0: Terminal invalid		• 1: Terminal valid	

D02.03	MCB input logic state 1	[Actual value]

Display the MCB input logic state by a 16-bit binary, as following table:

Bit15: Over-loaded	Bit14: Locked-elevator	Bit13: Down limitation	Bit12: Upper limitation
Bit11: Inspection down run	Bit10: Inspection up run	Bit9: Inspection	Bit8: Brake output feedback
Bit7: Run output feedback	Bit6: Locked-door circuit 2	Bit5: Locked-door circuit 1	Bit4: Safe circuit 2
Bit3: Safe circuit 1	Bit2: Door zone	Bit1: Down leveling	Bit0: Up leveling
• 0: No signal / no display / no input		• 1: Have signal / have display / have input	

D02.04	MCB input logic state 2	[Actual value]

Display the MCB input logic state by a 16-bit binary, as following table:

Bit15: Brake limit switch feedback input	Bit14: Motor over-heated input	Bit13: Syn. motor self-locked feedback	Bit12: Locked-door output feedback
Bit11: Battery-driven run	Bit10: Rear door light curtain	Bit9: Front door light curtain	Bit8: Fireman switch
Bit7: Firefighting signal	Bit6: Down forced 3 Dec.	Bit5: Up forced 3 Dec.	Bit4: Down forced 2 Dec.
Bit3: Up forced 2 Dec.	Bit2: Down forced 1 Dec.	Bit1: Up forced 1 Dec.	Bit0: Full loaded
• 0: No signal / no display / no input		• 1: Have signal / have display / have input	

D02.05	MCB input logic state 3	[Actual value]

Display the MCB input logic state by a 16-bit binary, as following table:

Bit15: Base station water entering input	Bit14: Terminal automatic running	Bit13: Speed regulator feedback input	Bit12: Low-voltage door lock short
Bit11: Brake traffic switch feedback input 2	Bit10: Light load signal	Bit9: Rear door prohibit	Bit8: Firefighting second base station NO input
Bit7: Half-load signal NO input	Bit6: High-voltage locked-door signal 2	Bit5: High-voltage locked-door signal 1	Bit4: High-voltage safe signal
Bit3: Edge feedback input for back door	Bit2: Edge feedback input for front door	Bit1: Brake forced feedback input	Bit0: Earthquake monitoring input
• 0: No signal / no display / no input		• 1: Have signal / have display / have input	

D02.06	MCB output logic state	[Actual value]

Display the MCB output logic state by a 16-bit binary, as following table:

Bit15: Non-door zone parking output	Bit14: Electric lock output	Bit13: Medical disinfection output	Bit12: Fire linkage output
Bit11: Battery-driven valid at power down	Bit10: Fault output	Bit9: Lighting and fan output	Bit8: Rear door close door
Bit7: Rear door open door	Bit6: Front door close door	Bit5: Front door open door	Bit4: Brake forced feedback output
Bit3: Syn. star-delta contactor output	Bit2: Locked-door contactor output	Bit1: Brake contactor output	Bit0: Run contactor output
• 0: No signal / no display / no output		• 1: Have signal / have display / have output	

7.1.4 D03: Display Parameters of CTB Board

D03.00	CTB analogue input voltage	[Actual value]

Display the CTB analogue input voltage.

D03.01	CTB input IO state	[Actual value]

Display the CTB input state by a 16-bit binary, as following table:

Bit15: Reserved	Bit14: Reserved	Bit13: X14 terminal	Bit12: X13 terminal
Bit11: X12 terminal	Bit10: X11 terminal	Bit9: X10 terminal	Bit8: X9 terminal
Bit7: X8 terminal	Bit6: X7 terminal	Bit5: X6 terminal	Bit4: X5 terminal
Bit3: X4 terminal	Bit2: X3 terminal	Bit1: X2 terminal	Bit0: X1 terminal
• 0: Terminal invalid		• 1: Terminal valid	

D03.02	CCB input IO state	[Actual value]

Display the CCB input state of main and vice COP by a 16-bit binary, as following table:

Bit15: Vice COP CCB X8 terminal	Bit14: Vice COP CCB X7 terminal	Bit13: Vice COP CCB X6 terminal	Bit12: Vice COP CCB X5 terminal
Bit11: Vice COP CCB X4 terminal	Bit10: Vice COP CCB X3 terminal	Bit9: Vice COP CCB X2 terminal	Bit8: Vice COP CCB X1 terminal
Bit7: Main COP CCB X8 terminal	Bit6: Main COP CCB X7 terminal	Bit5: Main COP CCB X6 terminal	Bit4: Main COP CCB X5 terminal
Bit3: Main COP CCB X4 terminal	Bit2: Main COP CCB X3 terminal	Bit1: Main COP CCB X2 terminal	Bit0: Main COP CCB X1 terminal
• 0: Terminal invalid		• 1: Terminal valid	

D03.03	CTB input logic state 1	[Actual value]

Display the CTB input logic state by a 16-bit binary, as following table:

Bit15: Fireman switch signal	Bit14: Isolated run signal	Bit13: Commutation signal	Bit12: Driver signal
Bit11: Direct arrival signal	Bit10: OD delay button	Bit9: CD button	Bit8: OD button
Bit7: Over-loaded signal	Bit6: Full load signal	Bit5: Rear door light curtain	Bit4: Rear door CD arrival
Bit3: Rear door OD arrival	Bit2: Front door CD arrival	Bit1: Front door OD arrival	Bit0: Front door light curtain
• 0: No signal / invalid		• 1: Have signal / valid	

D03.04	CTB input logic state 2	[Actual value]

Display the CTB input logic state by a 16-bit binary, as following table:

Bit15 - Bit11: Reserved	Bit10: Reserved	Bit9: Reserved	Bit8: Car call floors management
Bit7: Rear door prohibition	Bit6: Rear door OD delay button	Bit5: Front/back door switch input	Bit4: Rear door CD button
Bit3: Edge signal for back door	Bit2: Edge signal for front door	Bit1: Rear door OD button	Bit0: Light load signal
• 0: No signal / invalid		• 1: Have signal / valid	

D03.05	CTB output logic state 1	[Actual value]

Display the CTB output logic state by a 16-bit binary, as following table:

Bit15: Isolated run display	Bit14: Driver direction signal	Bit13: Driver run signal	Bit12: Full load signal output
Bit11: OD delay button display	Bit10: CD button display	Bit9: Front door OD button display	Bit8: Over-load signal output
Bit7: Buzzer output	Bit6: Lighting and fan output	Bit5: Down arrival chime output	Bit4: Up arrival chime output
Bit3: Rear door CD output	Bit2: Rear door OD output	Bit1: Front door CD output	Bit0: Front door OD output
• 0: No signal / no display / no output		• 1: Have signal / have display / have output	

D03.06	CTB output logic state 2	[Actual value]

Display the CTB output logic state by a 16-bit binary, as following table:

Bit15: Bypass output	Bit14: Manual fans	Bit13: R-cam output	Bit12: Mechanical lock output
Bit11: Timing output	Bit10: Leveling area car unintended movement	Bit9: Arrival chime output	Bit8: Rear door forced CD output
Bit7: Front door forced CD output	Bit6: Rear door OD delay button display	Bit5: Rear door CD button display	Bit4: Down arrival chime forecast
Bit3: Up arrival chime forecast	Bit2: Direct arrival signal display	Bit1: Rear door OD button display	Bit0: Firefighting run display
• 0: No display / no output		• 1: Have display / have output	

7.1.5 D04: Display Communication State of Service Floor and HCB&CTB Board

D04.00	Present floor	[Actual value]

Display the present floor which is relative to the bottom floor of the elevator.

D04.01	Present height	[Actual value]

Display the present height which is relative to the bottom leveling floor of the elevator.

D04.02	Distance of lowest floor	[Actual value]
D04.03	Distance of highest floor	[Actual value]

D04.02 and D04.03 respectively display the lowest and the highest of all floors.

D04.04	Registration state of 16 - 1 car call floor	[Actual value]
D04.05	Registration state of 32 - 17 car call floor	[Actual value]
D04.06	Registration state of 48 - 33 car call floor	[Actual value]

D04.07	Registration state of 16 - 1 hall call up	[Actual value]
D04.08	Registration state of 32 - 17 hall call up	[Actual value]
D04.09	Registration state of 48 - 33 hall call up	[Actual value]

D04.10	Registration state of 16 - 1 hall call down	[Actual value]
D04.11	Registration state of 32 - 17 hall call down	[Actual value]
D04.12	Registration state of 48 - 33 hall call down	[Actual value]

D04.04 - D04.12 are displayed by a 16-bit binary, and each bit binary represents one floor and the low bit represents low floor.

D04.04 - D04.06 display the car call registration of 48 - 1 floors.

D04.07 - D04.09 display the hall call up registration of 48 - 1 hall call address.

D04.10 - D04.12 display the hall call down registration of 48 - 1 hall call address.

- 1: Registration.
- 0: Not registration.

D04.13	HCB communication state of 16 - 1	[Actual value]
D04.14	HCB communication state of 32 - 17	[Actual value]
D04.15	HCB communication state of 48 - 33	[Actual value]

D04.13 - D04.15 are displayed by a 16-bit binary, and each bit binary represents one floor and the low bit represents low floor.

D04.13 - D04.15 display the communication state of HCB of 48 - 1 hall call address.

- 0: Normal communication.
- 1: Abnormal communication.

D04.16	Car communication state display	[Actual value]

Display by a 16-bit binary.

Bit0: Communication state of CTB and MCB

Bit1: Communication state of car display board

Bit2: CIC-B communication status

- 0: Normal communication
- 1: Abnormal communication

Bit2 - Bit15: Reserved

D04.17	Hall call Modbus communication interference evaluation	0.0 - 100.0 [Actual value]
D04.18	Car top CAN communication interference evaluation	0.0 - 100.0 [Actual value]
D04.19	Parallel CAN communication interference evaluation	0.0 - 100.0 [Actual value]

D04.17 - D04.19 indicate the communication quality. The larger the value is, the greater the communication interference is.

7.1.6 D05: Display Parameters of Elevator Run State

D05.00	Elevator system state	[Actual value]

Display the elevator system state by a 16-bit binary, as following table:

Bit15: System rear door edge 0: Invalid 1: Valid	Bit14: System front door edge 0: Invalid 1: Valid	Bit13: System over load 0: Invalid 1: Valid	Bit12: System full load 0: Invalid 1: Valid
Bit11 - Bit8: Reserved	Bit7 - Bit4: Elevator state 0000: Automation 0001: Inspection 0010: Battery-driven run 0011: Shaft self-learning	0100: Firefighting back to base station 0101: Fireman mode 0110: Driver mode 0111: Isolated run	1000: Auto back to leveling 1001: VIP operation
Bit3: Hall call firefighting 0: Invalid 1: Valid	Bit2: Hall call locked-elevator 0: Invalid 1: Valid	Bit1: System rear door light curtain 0: Invalid 1: Valid	Bit0: System front door light curtain 0: Invalid 1: Valid

D05.01	Door machine state	[Actual value]

Display the door motor state by a 16-bit binary, as following table:

Bit15 - Bit6: Reserved			
Bit5 - Bit3: Rear door motor state		Bit2 - Bit0: Front door motor state	
000: Opening 001: Open door arrival	010: Closing 011: Close door arrival	100: Door motor fault 101: Door motor stop	110: Reserved 111: No service of door motor

D05.02	High bit of elevator run times	[Actual value]
D05.03	Low bit of elevator run times	[Actual value]

Display the high bit and the low bit of elevator run times.

Run times = D05.02 × 65536 + D05.03.

D05.04	Total running time (hour)	[Actual value]

Display the elevator total running time and its unit is hour.

D05.05	Heatsink temperature	[Actual value]

Display the heatsink temperature and its unit is ℃.

D05.06	Present fault code	[Actual value]

Display the present fault code.

7.1.7 D06: Display Parameters of Elevator Hardware Configuration

D06.00	C phase AD sample value of Sincos encoder	[Actual value]
D06.01	D phase AD sample value of Sincos encoder	[Actual value]
D06.02	A phase AD sample value of Sincos encoder	[Actual value]
D06.03	B phase AD sample value of Sincos encoder	[Actual value]
D06.04	UVW state of UVW encoder	[Actual value]
D06.05	Electrical angle	[Actual value]
D06.06	Leveling switch number	[Actual value]
D06.07	Length between leveling switches	[Actual value]

Display the length between leveling switches. And the unit is mm.

D06.08	Leveling plate length	[Actual value]

Display the leveling plate length. And the unit is mm.

D06.09	Encoder pulse count	[Actual value]

Display the encoder pulse count.

When the motor is rotating, the encoder pulse input can be determined by the change of this parameter.

D06.10	Hardware version of MCB	[Actual value]

Display the hardware version of MCB (NL3000-MCB-A).

D06.11	Buzzer source	[Actual value]

Display the buzzer action source.

0: No action.

1: To remind at excessive position deviation returning to base station.

2: To remind there is hall call information at driver mode.

3: To remind at elevator over-loaded.

4: To remind at battery-driven.

5: To remind at forced close door.

6: To remind at firefighting back to base station.

7: To earthquake signal input.

8: UCMP fault.

9: Auto-return to leveling.

10: Light curtain reminding.

11: Ultimate brake zero speed operation reminder.

12: Bypass run signal reminder.

13: Remind of registrated floor in car.

14: Maintenance mode external fire switch action.

15: Maintenance mode external emergency input is valid.

16: Remind that Hand door lock is not closed.

17: Reminder of shaft self-learning.

18: Inspection running buzzer reminds.

D06.12	Bluetooth status 1	[Actual value]
D06.13	Front door motor status	[Actual value]
D06.14	Rear door motor status	[Actual value]

D06.15	MCB output logic 2	[Actual value]

Display the MCB output logic state by a 16-bit binary, as following table:

Bit15: Reserved	Bit14: Reserved	Bit13: Reserved	Bit12: UCM contactor output
Bit11: External energy feedback fault reset output	Bit10: R-cam output	Bit9: Reserved	Bit8: Speed regulator output
Bit7: Emergency buzzer output	Bit6: Emergency running completion	Bit5: Unintended movement of car in leveling area	Bit4: Down run signal output
Bit3: Up run signal output	Bit2: Integrated controller run output	Bit1: Brake, run contactor output normally	Bit0: Non-service state output
• 0: No output		• 1: Have output	

D06.16	HDRU feedback power display	[Actual value]
D06.17	HDRU energy feedback high bit	[Actual value]
D06.18	HDRU energy feedback low bit	[Actual value]

D06.17 displays the high bit of HDRU feedback energy. D06.18 displays the low.

D06.19	Return level times	[Actual value]
D06.20	Positon deviation	[Actual value]
D06.21	Times of big position deviation	[Actual value]
D06.22 - D06.27	Manufacturer debugging parameter, prohibit to change	
D06.28	Logic step	[Actual value]
D06.29	Bluetooth status 2	[Actual value]
D06.30 - D06.33	Manufacturer debugging parameter, prohibit to change	
D06.34	Inspection steps	[Actual value]
D06.35 - D06.40	Manufacturer debugging parameter, prohibit to change	

D06.41	Input R phase voltage	[Actual value]
D06.42	Input S phase voltage	[Actual value]
D06.43	Input T phase voltage	[Actual value]
D06.44	Days (power up time)	[Actual value]
D06.45	Mins (power up time)	[Actual value]
D06.46	Number of lost frames in CTB communicaiton	[Actual value]
D06.47	Car slip distance in braking	[Actual value]
D06.48	Software version of braking force detection	[Actual value]
D06.49	Last detecting date of brake force	[Actual value]
D06.50	Total door open time	[Actual value]

D06.51	Total door closing time	[Actual value]
D06.52	Remained running times	[Actual value]
D06.53	Automatic steps	[Actual value]
D06.54	UPS steps	[Actual value]

D06.55	Input terminals logic status 4	[Actual value]

Display MCB input logic status, in 16bits binary, see below table.

Bit15 - Bit11: Reserved	Bit10: Reserved	Bit9: High voltage door lock 3 signal	Bit8: UCM contactor feedback signal
Bit7: Main switch disconnects the input signal	Bit6: Emergency electric operation	Bit5: UPS fault input signal	Bit4: HDRU fault input signal
Bit3: Bypass input	Bit2: prohibite fast car input	Bit1: High voltage door lock adhension 2	Bit0: High voltage door lock adhension
• 0: Invalid		• 1: Valid	

D06.56	Manufacturer debugging parameter, prohibit to change	
D06.57	Static current detecting value	[Actual value]
D06.58 - D06.63	Manufacturer debugging parameter, prohibit to change	

D06.64	Remained days of maintenance	[Actual value]
D06.65	Input RS voltage	[Actual value]
D06.66	Input ST voltage	[Actual value]
D06.67	Input ST voltage	[Actual value]
D06.68	Code wheel angle	[Actual value]
D06.69	Bluetooth parameter	[Actual value]
D06.70	High bit of wire rope bending operations	[Actual value]
D06.71	Low bit of wire rope bending operations	[Actual value]
D06.72	High bit of Wire rope operating distance(m)	[Actual value]
D06.73	Low bit of Wire rope operating distance(m)	[Actual value]
D06.74	Start rolling pulse monitoring	[Actual value]
D06.75	Start stable judgment source	[Actual value]
D06.76	UPS varition 1	[Actual value]
D06.77	UPS varition2	[Actual value]
D06.78	UPS varition3	[Actual value]
D06.79	Correction angle deviation 1	[Actual value]
D06.80	Correction angle deviation 2	[Actual value]
D06.81 - D06.96	Manufacturer debugging parameters, prohibit changes	

D06.97	Car top board input logic 3	[Actual value]

Shows the CTB board input logic status, which is displayed by a 16-bit binary, see the following table:

Bit15 - Bit3: Reserved	Bit2: Down leveling signal	Bit1: Up leveling signal	Bit0: Door area signal
• 0: Invalid		• 1: Valid	

D06.98	Elevator counterweight and car record operating current at the same position	[Actual value]
D06.99	Software build number	[Actual value]

7.2 F: Function Parameters

7.2.1 F00: Basic Parameters

F00.00	Motor type	0, 1 [0]

0: Asynchronous motor (Asyn. motor).

1: Synchronous motor (Syn. motor).

Note:

1. If the motor type is selected as Asyn. motor, the motor parameters are corresponding to group F07.

2. If the motor type is selected as Syn. motor, the motor parameters are corresponding to group F10.

F00.01	Control mode	0 - 2 [2]

0: V/f control. The constant control voltage/frequency ratio is only applicable for the Asyn. motor.

1: SVC control. The vector control without speed sensor is only applicable for the Asyn. motor.

2: VC control. The vector control with speed sensor is applicable for normal distance control.

Note:

1. V/f control and SVC control are applicable for the Asyn. motor without installing encoder which is a kind of temporary run mode when the elevator is in inspection run.

2. The Syn. motor can only use the VC control, and must do the parameter auto-tuning before inspection running. Otherwise it may be out of control.

F00.02	Elevator Max. running speed	0.250 - F00.03 [1.500m/s]

Define the elevator Max. running speed.

- The upper limit of the setting range is F00.03 (elevator rated speed).
- Speed-related parameters of group F04 and group F19 should be smaller than F00.02.

F00.03	Elevator rated speed	0.250 - 4.000 [1.500m/s]

Define the elevator nominal rated speed.

- This speed is decided by the elevator mechanical structure and motor rated speed.

F00.04	Elevator rated load	100 - 50000 [1000kg]

Define the elevator nominal rated load.

- The anti-nuisance function will use F00.04.

F00.05	Controller Max. output frequency	5.00 - 100.00 [50.00Hz]

Define the controller allowable output Max. frequency.

Note: F00.05 must not be less than the motor rated frequency and is normally set as rated frequency of the motor.

F00.06	Traction machine mechanical parameter	10.0 - 6000.0 [60.0]

The formula for calculating motor mechanical parameters is as below:

$$\text{F00.06} = \frac{\pi \times D}{i \times \text{Winding mode}}$$

- D: Diameter of motor (mm). I: Dec. rate. Winding mode: To set in accordance with the actual elevator setting.

For example:

The diameter of motor is 600mm. The Dec. rate is 51/2 and the winding mode is 2/1. The F00.06 (traction machine mechanical parameter) is:

$$\text{F00.06} = \frac{3.14 \times 600}{(51/2) \times 2} = 36.9$$

Note:

F00.06 is calculated based-on the motor parameters. It determines the control precision and must be correctly set. otherwise it can not run normally at the distance control. The specific performances are as follows:

1. The keypad display speed and the elevator actual speed are inconsistent.

2. The data from shaft self-learning and the actual floor data are different.

F00.07	Operation mode	0, 1 [1]

0: Keypad control.

- Via **RUN** and **STOP** keys of the keypad to control. The running speed is set by F00.09.
- Only use for testing or motor parameter auto-tuning.

1: Distance control.

- At inspection running, the elevator runs in accordance with F04.00 (inspection run speed).
- At normally running, automatically calculating the speed and run curve in accordance with the elevator present floor and the distance of destination floor achieves direct stop.

Note: At elevator normally running, F00.07 must be set as 1.

F00.08	Manufacturer debugging parameter	0 - 100 [45%]
F00.09	Speed setting via keypad	0.000 - F00.02 [1.500m/s]

When F00.07 = 0, set run time target speed.

F00.10	Elevator run direction	0, 1 [0]

0: The elevator runs in the same direction as the command direction.

1: Elevator running direction and instruction direction is reversed.

Note:

1. When debugging the elevator, if the preset direction and the elevator actual run direction are inconsistent, you can set the inverse F00.10.

2. When normally run, F00.10 can not be changed. If the original system has floor data, when modify F00.10, the shaft self-learning is needed to restart.

7.2.2 F01: User Manual Parameters

F01.00	User password	00000 – 65535 [12345]

XXXX: Set the user password (any non-zero digital).

- Once the password is set, after press **ENT** key, and then detect that there is no press on the keypad within five minutes, the user password will be valid. If detect a press on the keypad key within five minutes, a 5-minute timer will be restarted.
- If the password is valid, it is necessary to input correct password if you want to check and change the parameters.

12345: NL3000 factory setting.

Note: After the user password is set, you should keep the password in mind.

F01.01	Menu mode selection	0 - 2 [0]

0: Standard menu mode. All of the parameter can be displayed.

1: Checking menu mode. Only different from factory setting parameters can be displayed.

2: Reserved.

F01.02	MCB parameter update	0 - 12 [0]

0: No operation.

1: Restore to factory settings.

- Except group F01, F07.00 - F07.14, F10.00 - F10.09, group F11, F15.00, F17.08 - F17.33 and group Y.
- **Operation steps:** Set F01.02 = 1, press **ENT** key to confirm and restore the factory settings, the keypad will display the "loading default parameter". Then the keypad will jump to "status display interface" after finish restoring to factory setting.

2: Download keypad parameter group 1 to MCB.

- Except group F01, F17.08 - F17.33 and group Y.
- At downloading parameters, such as motor parameters, encoder parameters and magnetic pole angle etc. will be downloaded. The original motor parameters, encoder parameters and magnetic pole angle etc. need to be recorded, or restart parameter auto-tuning.

3: Clear fault information.

- The faulty history information of 17.08 - F17.33, F27.30 - F27.35, F27.36 - F27.58 will be cleared.
- **Operating steps:** Set F01.02 = 3, press **ENT** key to confirm and clear fault information, the keypad will display "clearing fault information". Then the keypad will display next parameter F01.03 after finish clearing the fault information.

4: Download the keypad parameter group 2 to MCB.

5: Download the keypad parameter group 3 to MCB.

6: Download the keypad parameter group 4 to MCB.

7: Download the keypad parameter group 5 to MCB.

8: Download the keypad parameter group 6 to MCB.

9: Download the keypad parameter group 7 to MCB.

10: Download the keypad parameter group 8 to MCB.

11: Download the keypad parameter group 9 to MCB.

12: Download the keypad parameter group 10 to MCB.

Note: Only with NL3000-LCD-B, No. 4 - 12 functions can be valid, the same with No. 2 function.

F01.03	Keypad parameter update	0 - 10 [0]

0: No operation. NL3000 is in the normal parameters of read and write state.

1: Upload MCB parameters to keypad parameter group 1. Except group F01, F17.08 - F17.33 and group Y.

2: Upload MCB parameters to keypad parameter group 2.

3: Upload MCB parameters to keypad parameter group 3.

4: Upload MCB parameters to keypad parameter group 4.

5: Upload MCB parameters to keypad parameter group 5.

6: Upload MCB parameters to keypad parameter group 6.

7: Upload MCB parameters to keypad parameter group 7.

8: Upload MCB parameters to keypad parameter group 8.

9: Upload MCB parameters to keypad parameter group 9.

10: Upload MCB parameters to keypad parameter group 10.

Note: Only with NL3000-LCD-B, No. 2 - 10 functions can be valid.

Parameter upload (F01.03 = 1) and download (F01.02 = 2)

You can simplify the parameter setting via parameter upload and download to improve debugging efficiency. Parameter upload and download are generally applied on the following occasions:

1. After on-site debugging one elevator, this elevator parameter is needed to copy to another elevator.

2. If the on-site debugging MCB need to be replaced by a new one, the new MCB parameters need to re-set.

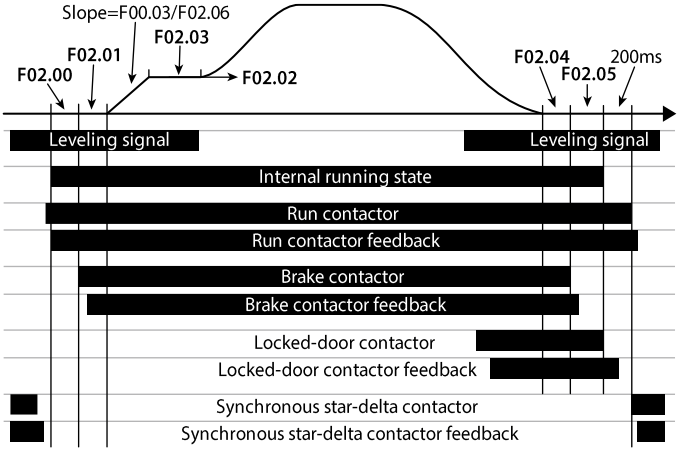
Both of these cases can set F01.03 as 1 (upload parameter to keypad), then in the other MCB set F01.02 as 2 (download parameter to MCB).

Notes of upload and download:

1. *For the replaced MCB, after parameters upload and download, if equipped with Sincos encoder card, the parameter auto-tuning should be restarted due to the MCB hardware parameter differences.*
2. *For different elevator parameters download, you need to restart shaft self-learning. otherwise the floor data may be inconsistent with the actual, which can affect the normal operation of the elevator.*
3. *Replace the MCB for different motor, you need to re-start parameter auto-tuning, or it may be out of control.*
4. *Parameter upload and download can be done only at the inspection mode or keypad control mode.*

7.2.3 F02: Start and Stop Parameters

The correspondence relationship of various signals and curves in the running process.



F02.00	Retention time of start zero-speed	0.000 - 2.000 [0.200s]

Define the time of zero-speed output before brake-open. During this time, a magnetic field can be created, which may improve the starting comfort.

F02.01	Delay time of curve run	0.000 - 2.000 [0.500s]

Define the delay time of curve from zero-speed to preset speed.

Note: When F05.00 = 3 (pre-torque auto-compensation), F02.01 is set to at least 0.5s.

F02.02	Start speed	0.000 - 0.030 [0.000m/s]
F02.03	Retention time of start speed	0.000 - 2.000 [0.000s]

F02.02 defines the NL3000 initial speed at start.

- Setting a suitable start speed can overcome the static friction at elevator starting, but if the setting is too large, it will cause the starting instant impact.

F02.03 defines the retention time of running start speed (F02.02) during NL3000 starting process.

F02.04	Brake close delay time at stop	0.000 - 2.000 [0.200s]

Define the time of NL3000 from zero-speed to brake close command output.

F02.05	Zero-speed retention time at stop	0.000 - 2.000 [0.300s]

Define the time of keeping motor zero-speed with output torque at stopping, which may improve the comfort.

F02.06	Start ramp time	0.000 - 2.000 [0.000s]

Define the time that elevator takes to accelerate from zero to the elevator rated speed (F00.03) with the use of F02.02. When F02.06 is set as 0, the ramp is invalid.

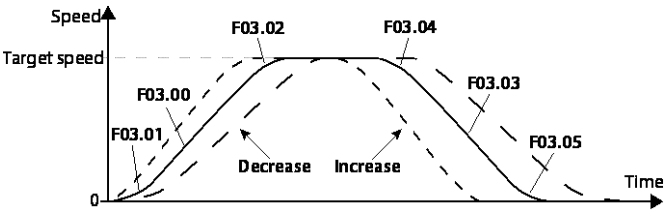
F02.07	Over current setting	80 - 150 (motor rated current) [120%]
F02.08 - F02.09	Manufacturer debugging parameter, prohibit to change	

7.2.4 F03: Acc. and Dec. Curve Parameters

F03.00	Acc. speed	0.020 - 2.000 [0.600m/s^2]
F03.01	Start Acc. jerk	0.020 - 2.000 [0.300m/s^3]
F03.02	End Acc. jerk	0.020 - 2.000 [0.300m/s^3]
F03.03	Dec. speed	0.020 - 2.000 [0.600m/s^2]
F03.04	Start Dec. jerk	0.020 - 2.000 [0.300m/s^3]
F03.05	End Dec. jerk	0.020 - 2.000 [0.300m/s^3]

The following figure shows the effect of F03.00 - F03.05 at elevator running S-curve.

- Acc. / Dec. jerk: The change ratio of Acc. / Dec.
- The S-curve becomes steeper and Acc. / Dec. become faster when parameter values are raised.
- The S-curve and Acc. / Dec. become slower when parameter values are decreased.



F03.06	Inspection Acc. speed	0.020 - 2.000 [0.200m/s^2]
F03.07	Inspection Dec. speed	0.200 - 2.000 [0.400m/s^2]

Define the elevator Acc. and Dec. speed at inspection run mode.

F03.08	Battery driven Acc. speed	0.020 - 2.000 [0.200m/s^2]
F03.09	Battery driven Dec. speed	0.020 - 2.000 [1.000m/s^2]

Define the elevator Acc. and Dec. speed at battery driven run mode.

F03.10	Asyn. motor parameter auto-tuning Acc. speed	0.020 - 2.000 [0.100m/s^2]
F03.11	Asyn. motor parameter auto-tuning Dec. speed	0.020 - 2.000 [0.100m/s^2]

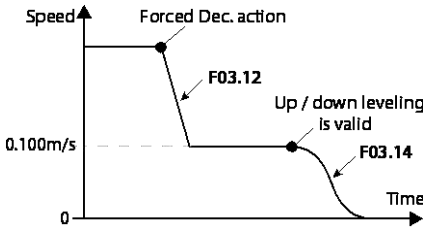
Define the Asyn. motor Acc. and Dec. speed at rotating auto-tuning.

F03.12	Forced Dec. speed	0.500 - 2.000 [1.000m/s^2]

Define the Dec. speed when the forced Dec. is effective.

- When the up and down forced Dec. switch is action and the present detected speed is larger than F04.06 - F04.08, the forced Dec. will be valid.
- When the up and down forced Dec. switch is action and the deviation of the present position and the shaft self-learning position are too large, the forced Dec. will be valid.

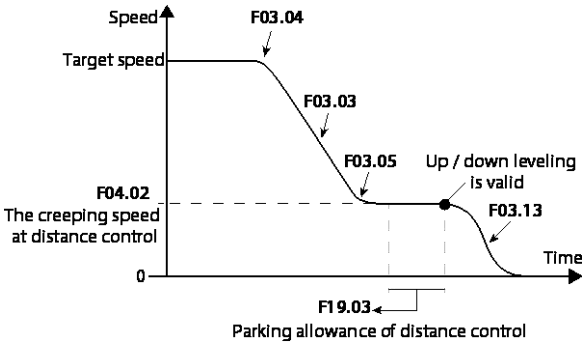
When the forced Dec. switch is action, the elevator decelerates to 0.100m/s in accordance with F03.12 and creeps to the leveling area, slow down at speed of F03.14 and stop, which is shown as following figure.



F03.13	Stop Dec. jerk	0.002 - 2.000 [0.230m/s^3]

Define the Dec. jerk from creeping speed to zero-speed at direct parking mode 1 (F19.06 = 1) to adjust the leveling effect with the creeping speed (F04.02) together, as following figure.

- When modify F04.02, NL3000 will automatically update F03.13.
- Just fine-tuning F03.13 can adjust the leveling accuracy.
- F03.13 is automatically updated in the shaft self-learning.



F03.14	Forced stop Dec. jerk	0.002 - 2.000 [0.080m/s^3]

This parameter is used to ensure the leveling accuracy at forced Dec. action.

This parameter is automatically updated in the shaft self-learning, and generally not need to change by the user.

F03.15	Up leveling distance adjustment	0 - 60 [30mm]
F03.16	Down leveling distance adjustment	0 - 60 [30mm]
F03.17	Enable of up and down leveling isolated adjustment	0, 1 [0]

F03.17 defines the upper and lower leveling distance adjustments.

0: Up and down leveling via F19.03.

1: In up, leveling adjustmen via F03.15, in down, leveling adjustmen via F03.16.

Default value of F03.15, F03.16 is 30mm, the adjustment method is as follows:

- If the elevator goes up more than 10mm each layer, then F03.15 reduced 10mm, modified to 20mm;.
- If the elevator goes down less than 15mm each layer, then F03.16 increase 15mm, modified to 45mm.

F03.18	Brake force detection mode	0 - 2 [0]

F03.18 defines the detection method of the brake force.

0: Invalid.

1: Manual start detection.

2: Automatic start detection.

The brake braking force detection is based on an automatic detection function of the elevator holding brake force. When the elevator is normal, F03.18 is set to 2 (automatic start detection). The elevator control system will perform braking force detection according to the setting values of F03.19, F03.20, F04.14 - F04.16.

- When the test is successful, the F04.17 value is automatically increased by one. If brake detection fails, the system will report E66 (Brake Force Self-Test Fault). This fault can only be manually reset in the inspection mode.
- When elevator maintenance, if you need to manually start the test function, you can set the parameter of small keypad F14 from 0 to 1 or F25.04 Bit8 to 1 (manually start brake force detection). When the above-mentioned manual start, even if F03.20 is set to 0, the brake braking force detection is valid.

F03.19	Brake force detection period	1 - 15 [1 day]
F03.20	Brake force detection time	00:00 - 23:59 [3:00]

7.2.5 F04: Speed Parameters

F04.00	Inspection run speed	0.000 - 0.630 [0.250m/s]

Define the run speed of the elevator at the inspection mode. Elevator GB provides the speed can not be greater than 0.63m/s.

- The elevator inspection runs to up and down effectively forced signal and the running speed is 0.100m/s.
- After the inspection up and down run direction is revoked, the stop mode can be set as immediate stop or Dec. stop (set by the F26.12 Bit2).
- When the inspection run encounters the upper and lower limit, in order to prevent crossing the limit, the stop mode will become immediate stop.

F04.01	Battery driven run speed	0.020 - 0.100 [0.050m/s]

Define the elevator run speed at battery driven mode. (Non-automatic running car).

F04.02	The creeping speed at distance control	0.050 - 0.150 [0.100m/s]

Define the creeping speed of the direct parking mode 1 (set F19.06 as 1).

F04.03	Shaft self-learning speed	0.100 - 0.300 [0.2000m/s]

Define the elevator speed at the shaft self-learning.

F04.04	Re-leveling speed	0.020 - 0.080 [0.040m/s]

Define the elevator running speed in a non-inspection mode, automatically return to the leveling process to reach the leveling area (where a leveling switch has been activated, and the other leveling switch unactuated), and the running speed in open door of the re-leveling.

- In the non-leveling area, the speed at which automatically returns to leveling is 0.200m/s.

F04.05	Advanced open speed	0.020 - 0.100 [0.050m/s]

Define that open the door in advance when the elevator running speed is less than F04.05.

Note:

1. When set F26.05 = 1 (with advanced open function), this parameter is valid.

2. The advanced open block (NL3000-AOB-A) should be equipped.

F04.06	Forced Dec. speed setting 1	0.0 - 105.0 (F00.03) [103.0%]
F04.07	Forced Dec. speed setting 2	0.0 - 105.0 (F00.03) [103.0%]
F04.08	Forced Dec. speed setting 3	0.0 - 105.0 (F00.03) [103.0%]

The preset values of F04.06 - F04.08 are relative to the percentage of the elevator rated speed.

- F04.06 is corresponding to the speed reference point of up/down forced Dec. switch 1.
- F04.07 is corresponding to the speed reference point of up/down forced Dec. switch 2.
- F04.08 is corresponding to the speed reference point of up/down t forced Dec. switch 3.
- At up/down forced Dec. switch action, if the car speed is greater than the forced Dec. speed setting (F04.06 - F04.08), it will decelerate to 0.100m/s in accordance with forced Dec. (F03.12).
- There are three forced Dec. switches installing in the shaft, and their positions are refered to the figure of parameters F19.12 - F19.14.

F04.09	Over-speed setting	80.0 - 120.0 (F00.03) [115.0%]
F04.10	Over-speed detection time	0.1 - 2.0 [0.3s]

When elevator actual speed exceeds the F04.09 setting and lasts longer than the F04.10 setting, it will alarm E0032 fault (motor over speed).

- The setting value of F04.09 is relative to the percentage of elevator rated speed.

F04.11	Detected value of speed deviation	5.0 - 30.0 (F00.03) [20.0%]
F04.12	Detected time of speed deviation	0.1 - 2.0 [1.0s]

When the deviation of preset speed and motor actual running speed exceeds the F04.11 setting, and lasts longer than the F04.12 setting, it will alarm E0018 fault (excessive speed deviation).

- The setting value of F04.11 is relative to the percentage of elevator rated speed.

F04.13	Low speed back leveling speed	0.080 - F04.00 [0.200m/s]

F04.13 is used to set the speed when the elevator returns to the leveling position when the elevator is in the normal state and stops.

It is also the operating speed when the position deviation is too large to return to the base station.

F04.14	Brake detection duration time	1 - 10 [5s]
F04.15	Brake detection torque	60 - 150 [100%]
F04.16	Brake detection allowable pulse size	1 - 99 [10]
F04.17	times of successful brake detection	0 - 65535 [0]

7.2.6 F05: Weighing Compensation Parameters

F05.00	Pre-torque selection	0 - 3 [0]

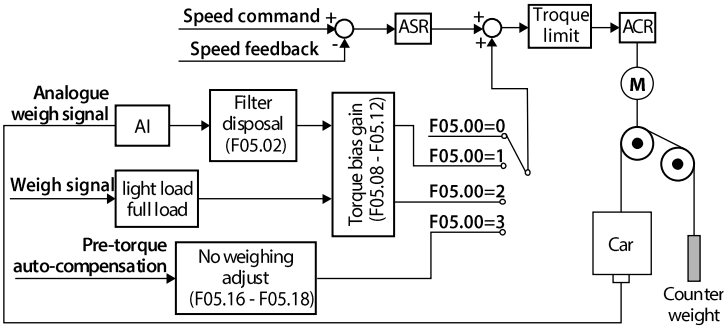
Starting pre-torque function can pre-output torque which is corresponds to the torque of load weight, to avoid the car slipping at starting and reduce start impact.

0: No pre-torque.

1: Analogue weighing. The corresponding compensation torque will be output in accordance with the input analog weighing signal.

2: Digital weighing. The corresponding compensation torque will be output in accordance with the input digital weighing signal.

3: Pre-torque auto-compensation.



F05.01	Weighing input selection	0 - 3 [2]

To set the weighing input in accordance with the elevator equipped with weighing device type. If there are both analog weighing and digital weighing, you can simply set the corresponding analog (F05.01 is set as 2 or 3), and the digital weighing can be set at the input terminal.

0: No weighing.

1: CTB digital weighing.

2: CTB analogue weighing.

3: MCB analogue weighing.

F05.02	Weighing analogue filter time	0.00 - 2.00 [0.50s]

Define the analogue filter time.

- The greater F05.02 is, the stronger filtering effect is, and the greater the signal lag is.

F05.03	Analogue weighing self-learning	0 - 2 [0]
F05.04	Car no-load	0.00 - 10.00 [0.00V]
F05.05	Car full load	0.00 - 10.00 [8.00V]
F05.06	Self-learning car load	0 - 100 [0%]

F05.03 defines the analogue weighing self-learning modes.

0: No self-learning.

1: No-load self-learning.

2: Other load self-learning.

- Refer to the torque compensation of section 8.2.9 Adjustment for Comfortable Feeling (page 169) about F05.03 - F05.06.

F05.07	Anti-nuisance function	0 - 3 [0]

0: No anti-nuisance function.

1: In accordance with weighing. This function must work with analogue weighing sensor or digital light-load signal.

- If the car command registered number is over the person number in car plus three, the system will clear up all commands (and each person according to 70kg).

2: In accordance with light curtain. This function must work with light curtain signal.

- When the elevator runs and arrives to the station for three consecutive times and the OD light curtains are not action, which will be considered as nuisance and all of the car commands will be automatically cleared up.

3: Both weighing and light curtain. Both weighing and light curtain will work.

Note: The anti-nuisance function will not work at the test mode (set F25.03 as non-zero value).

F05.08	Pre-torque bias	0.0 - 100.0 [50.0%]
F05.09	Up electrical pre-torque gain	0.000 - 9.000 [1.000]
F05.10	Up brake pre-torque gain	0.000 - 9.000 [1.000]
F05.11	Down electrical pre-torque gain	0.000 - 9.000 [1.000]
F05.12	Down brake pre-torque gain	0.000 - 9.000 [1.000]

F05.08 is actually the balance coefficient of the elevator and it is also the percentage of the rated weight in the car when the car is in balance with the counterweight.

F05.09 - F05.12 are the elevator pre-torque coefficients when the motor is in electrical or brake state.

- If the car is in full loading, the elevator runs up, the motor is in electrical running state. The elevator runs down, the motor is in brake running state.
- If the car is in non-loading, the elevator runs up, the motor is in brake running state. The elevator runs down, the motor is in electrical running state.
- The greater the gain is, the greater the elevator start compensation value is.
- The controller can identify the electrical and brake state according to the weighing sensor signals, and then work out desirable torque compensation values.

When set F05.00 as 1 (analogue weighing) or 2 (digital weighing), details of adjusting ways are as follows:

- In up electrical state, if the elevator rolls back when starts, increase F05.09. If the elevator rushes to start, reduce F05.09.
- In up brake state, if the elevator rolls back when starts, increase F05.10. If the elevator rushes to start, reduce F05.10.
- In down electrical state, if the elevator rolls back when starts, increase F05.11. If the elevator rushes to start, reduce F05.11.
- In down brake state, if the elevator rolls back when starts, increase F05.12. If the elevator rushes to start, reduce F05.12.

F05.13	Light-load digital weighing signal	0.0 - 100.0(F00.04) [20.0%]
F05.14	Heavy-load digital weighing signal	0.0 - 100.0(F00.04) [80.0%]

Define the elevator load when the light-load signal and the full-load signal of car top board are valid.

Its setting is relative to the rated weight of the elevator.

F05.15	Compensation coefficient of wire rope	0.000 - 9.000 [0.000]

The smaller the value, the faster the torque rises. The larger the value, the slower the torque rises.

This parameter is valid only for digital torque and forced drive. Modifying this parameter can effectively reduce startup noise.

This parameter is used with F07.20 Bit8.

For both asynchronous and Syn. motors.

F05.16	No weighing current coefficient	0 - 9999 [3000]
F05.17	No weighing speed-loop KP	1 - 9999 [1000]
F05.18	No weighing speed-loop KI	1 - 9999 [1000]

F05.16 - F05.18 are used to adjust the effect of pre-torque auto-compensation (F05.00 = 3).

- To increase F05.16 - F05.18 can increase the response speed of the system, but too large will cause the system overshoot and oscillation.
- At debugging, adjusting F05.16 can achieve the elevator smooth start generally.
  - At the starting moment the elevator slips car, increase F05.16. at the starting moment elevator.

7.2.7 F06: Manufacturer Debugging Parameters

F06.00 - F06.05	Manufacturer debugging parameter, prohibit to change	

7.2.8 F07: Asyn. motor Parameters

F07.00	Asyn. motor rated power	0.2 - 500.0kW [Depend on model]
F07.01	Asyn. motor rated voltage	0 - 999V [Depend on model]
F07.02	Asyn. motor rated current	0.0 - 999.9A [Depend on model]
F07.03	Asyn. motor rated frequency	1.00 - F00.05 [50.00Hz]
F07.04	Asyn. motor rated RPM	1 - 24000 [1440rpm]
F07.05	Asyn. motor power factor	0.001 - 1.000 [0.850]

Please set F07.00 - F07.05 in accordance with parameters of motor nameplate.

F07.06	Asyn. motor parameter auto-tuning	0 - 2 [0]

0: No action.

1: Motor auto-tuning with load.

2: Motor no-load auto-tuning.

- See the section 8.2.3 Motor Parameter Auto-tuning (page 158) for the detail parameter auto-tuning.

F07.07	Asyn. motor stator resistance	0.000 - 65.535Ω [Depend on model]
F07.08	Asyn. motor rotor resistance	0.000 - 65.535Ω[Depend on model]
F07.09	Asyn. motor inductance	0.0 - 6553.5mH [Depend on model]
F07.10	Asyn. motor mutual inductance	0.0 - 6553.5mH [Depend on model]
F07.11	Asyn. motor no-load current	0.0 - 999.9A [Depend on model]
F07.12	Asyn. motor of core saturation coefficient 1	0.00 - 0.50 [0.50]
F07.13	Asyn. motor of core saturation coefficient 2	0.00 - 0.75 [0.75]
F07.14	Asyn. motor of core saturation coefficient 3	0.00 - 1.20 [1.20]

After the motor parameters are self-tuned, the parameters F07.07 - F07.14 are automatically updated.

F07.15	Asyn. motor torque boost	0.1 - 30.0 [0.1%]
F07.16	Asyn. motor torque boost end-point	0.0 - 50.0 (F07.03) [10.0%]
F07.17	Asyn. motor of rotation compensation gain	0.0 - 300.0 [100.0%]
F07.18	Asyn. motor of rotation compensation filter time	0.1 - 10.0 [0.1s]
F07.19	Asyn. motor of rotation compensation limitation	0.0 - 250.0 [200.0%]

Note: F07.15 - F07.18, F07.19 can only work at V/f control and Asyn. motor parameter no-load auto-tuning.

F07.20	Asyn. motor performance optimization	0 - 65535 [1]

Bit0: Exciting current optimization

0: Normal processing.

1: Optimization processing.

Bit1: Methods of exciting current optimization

0: Voltage method.

1: Current method.

Bit2: Asyn. pre-torque compensation new algorithm

0: Invalid.

1: Valid.

Bit3: Dec. point processing

Bit4: Rotor resistance identification frequency

0: Optimize.

1: Normal.

Bit5: Magnetic field orientation

0: According to the rotor resistance orientation.

1: Simple orientation according to current.

Bit7 - Bit6: Syn. motor startup current limiter

00: Normal.

01: 2 times.

10: 4 times.

11: 8 times.

Bit8: Digital pre-torque with strong drive (without counterweight) start

0: No digital pre-torque.

1: Add digital pre-torque.

Bit9 - Bit15: Reserved

F07.21	Asyn. motor of oscillation-suppression mode	0, 1 [1]

0: According to the excitation component.

1: According to the torque component.

F07.22	Asyn. motor of oscillation-suppression coefficient	0 - 200 [100]

For suppressing the inherent oscillations generated by NL3000 with motor.

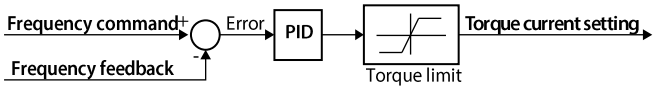
- If the constant load runs, when the output current changes repeatedly, can set F07.22 on the basis of the factory setting parameters to eliminate the oscillation, so that the motor can run smoothly.

Note: F07.21 and F07.22 can only work at V/f control and Asyn. motor parameter no-load auto-tuning.

7.2.9 F08: Vector Control Speed-loop Parameters

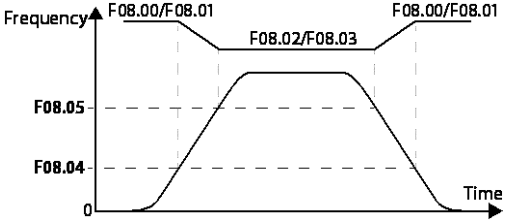
F08.00	Low speed ASR KP	1 - 9999 [500]
F08.01	Low speed ASR KI	1 - 9999 [500]
F08.02	High speed ASR KP	1 - 9999 [500]
F08.03	High speed ASR KI	1 - 9999 [500]
F08.04	ASR PI switching frequency 1	0.00 - 50.00 [10.00Hz]
F08.05	ASR PI switching frequency 2	0.00 - 50.00 [15.00Hz]

The parameters of F08.00 - F08.07 comfirm the PID parameters of ASR. The structure of ASR is shown in following figure:



As the following figure:

- When operates in a range of 0 - F08.04, the PI parameters of vector control are F08.00 and F08.01
- When operates above F08.05, the PI parameters of vector control are F08.02 and F08.03;
- When operates with frequency in a range of F08.04 - F08.05, vector control P parameter is the linear interpolation between F08.00 and F08.02, while vector control I parameter is the linear interpolation between F08.01 and F08.03.



- The system's response can be expedited through increasing the ASR KP (F08.00, F08.02), but oscillation may occur if the value of KP is too high.
- The system's response can be expedited through increasing the ASR KI (F08.01, F08.03), but oscillation and high overshoot happen easily if the value of KI is too high.
  - If F08.01/F08.03 = 0, and the integral function is disabled, the speed-loop works only as a proportional regulator.
- Generally, the KP should be adjusted firstly to the Max. on condition that the system does not vibrate, and then the KI should be adjusted to shorten the response time without overshoot.

F08.06	ASR integral limitation	0.0 - 200.0 (motor rated current) [180.0%]

Define the Max. integral value of the vector control ASR integral. Its setting is relative to the percentage of the motor rated current.

F08.07	ASR differential time	0.000 - 1.000 [0.000s]

Define the vector control ASR differential time. No need to set normally. When it is necessary to accelerate the dynamic response, it may be set appropriately.

- There isn't speed-loop differential when F08.07 = 0.

F08.08	ASR output filter time	0.000 - 0.256 [0.008s]

Filter the output of ASR (speed-loop) regulator.

- When F08.08 = 0, the speed-loop filter is disabled.

F08.09	Torque limitation	0.0 - 200.0 (motor rated current) [180.0%]

F08.09 is used to set the torque upper limitation. Its setting is relative to the percentage of the motor rated current.

- If the torque is too small, the run speed may deviate from the setting value.

Note: Users generally do not need to modify F08.06 - F08.09.

7.2.10 F09: Vector Control Current-Loop Parameters

F09.00	Current-loop KP	1 - 4000 [500]
F09.01	Current-loop KI	1 - 4000 [500]

Define the PI regulator parameter of current-loop (ACR).

- F09.00 and F09.01 directly impact the system dynamic response speed and control accuracy, and the appropriate adjustment may be required on different occasions.
- The Syn. motor may have obvious effect to the comfort by adjusting F09.00 and F09.01, and the jitter in elevator operation can be suppressed by adjusting appropriately.

F09.02	Current-loop output filter time	0.000 - 1.000 [0.000s]

When F09.02 = 0, the current-loop output has no filter. And users generally do not need to change.

F09.03	Manufacturer debugging parameter, prohibit to change	
F09.04	Current loop execution period	1 - 10 [6k]

This is valid only when F10.20 Bit15 = 1 (new method of vibration optimization).

F09.05	Static Current	0.0 - 9.9 [0.0A]
F09.06	High-speed current loop KP	0 - 4000 [500]
F09.07	High speed current loop KI	0 - 4000 [500]

7.2.11 F10: Syn. Motor Parameters

F10.00	Syn. motor type	0, 1 [0]

0: IPM.

1: SMPM.

F10.01	Syn. motor rated power	0.4 - 400.0kW [Depend on model]
F10.02	Syn. motor rated voltage	0 - 999V [Depend on model]
F10.03	Syn. motor rated current	0.0 - 999.9A [Depend on model]
F10.04	Syn. motor rated frequency	1.00 - F00.05 [19.20Hz]
F10.05	Syn. motor rated RPM	1 - 24000 [96rpm]
F10.06	Syn. motor stator resistance	0.000 - 9.999 [0.000Ω]
F10.07	Syn. motor cross axis inductance	0.0 - 999.9 [0.0mH]
F10.08	Syn. motor direct axis inductance	0.0 - 999.9 [0.0mH]
F10.09	Syn. motor back EMF	0 - 999 [0V]

Please set F10.01 - F10.09 in accordance with parameters of motor nameplate.

F10.10	Syn. motor of angle auto-tuning	0 - 2 [0]

0: No action.

1: Static angle auto-tuning.

2: Rotation angle auto-tuning.

- See the section8.2.3 Motor Parameter Auto-tuning (158) for the auto-tuning.

F10.11	Syn. motor auto-tuning with load voltage setting	0.0 - 100.0 (F10.02) [100.0%]

If the overcurrent fault is alarmed at Syn. motor auto-tuning with load, it may reduce the setting value appropriately.

F10.12	Syn. motor initial angle	0.0 - 359.9 [0.0°]
F10.13	Manufacturer debugging parameter, prohibit to change	

F10.12 is a learning angle after Syn. motor auto-tuning and an important parameter for the Syn. motor normal starting, which should not be arbitrarily changed.

F10.14	Sincos encoder C amplitude	0 - 9999 [2048]
F10.15	Sincos encoder C zero-bias	0 - 9999 [2048]
F10.16	Sincos encoder D amplitude	0 - 9999 [2048]
F10.17	Sincos encoder D zero-bias	0 - 9999 [2048]
F10.18	Sincos encoder CD phase	0, 1 [0]

F10.14 - F10.18 auto-tuning results with sincos encoder, and can not be changed casually.

The meaning of F10.18 is as following:

- 0: Normal. 1: CD phase is opposite.

F10.19	Syn. motor current filter coefficients	0 - 40 [0]
F10.20	Performance optimization parameters	0 - 65535 [5188]

Bit0: Inspection run parameter auto-tuning

0: Do not automatically.

1: Automatically.

Bit1: Current loop parameters are automatically optimized

0: Manually.

1: Automatically.

Bit2: SINCOS encoder performace optimized

Bit3: Elevator speed and grid voltage optimization

0: Normal processing.

1: Optimization processing.

Bit4: High speed current loop parameter enable

0: Not enabled.

1: Enabled.

Bit5: High-speed current loop parameter range

0: Calculated based on the speed corner frequency.

1: Automatic pre-torque start adopts F09.00/F09.01, others use F09.06/F09.07.

Bit6: Start comfort

Bit7: High speed comfortability

0: Mode 0.

1: Mode 1.

Bit8: Loop algorithm selection

0: Old algorithm.

1: New algorithm.

Bit10&Bit9: Performance optimization

00: Mode 0.

01: Mode 1.

10: Mode 2.

11: Mode 3.

Bit11: Reserved

Bit12: Syn. motor start oscillation suppression

0: No suppression.

1: Suppression.

Bit13: Start optimization 2

0: Not start.

1: Start.

Bit14: Current sampling method

0: Mean sampling.

1: Single sampling.

Bit15: Vibration optimization

0: Old method.

1: New way.

7.2.12 F11: Encoder Parameters

In the elevator application, the rotary encoder of the motor is indispensable configuration.

Refer to section 0 (page 42) for the details of encoder card.

F11.00	Encoder card selection	1 - 5 [1]

1: ABZ incremental encoder card (NL-PG1-ABZ).

- Only apply to Asyn. motor.

3: SINCOS encoder card (NL-PG2-SINCOS).

- Only apply to syn. Motor. It is used to adapt the SINCOS encoder, such as the HEIDENHAIN ERN1387-type SINCOS encoder.

F11.01	Encoder P/R	1 - 11000 [1024]
F11.02	Encoder direction setting	0, 1 [0]

The effect of changing F11.02 is equivalent to changing the AB two phase sequence of encoder.

0: The same direction.

1: The reverse direction.

F11.03	Encoder signal filter coefficient	00 - 99 [11]

F11.03 generally does not need to change, if there is obvious current noise during motor running process, it can be appropriately modified.

Unit: Low speed of filter coefficient.

Ten: High speed of filter coefficient.

F11.04	Manufacturer debugging parameter, prohibit to change	
F11.05	Detecting time of encoder wire disconnection	0.00 - 2.00 [1.00s]

Define the continuous detection time of encoder wire disconnection fault.

NL3000 detects the encoder wire disconnection and lasts more than the time set by F11.05, it will alarm E0031 fault (encoder disconnection).

- F11.05 = 0, the encoder wire disconnection can be detected.

7.2.13 F12: MCB Board Terminal Parameters

F12.00	MCB input terminal filter time	2 - 40 [10ms]

Define the MCB input terminal (X1 - X27) filter time, used to set the sensitivity of the input terminal.

- As input terminals are vulnerable to interference and cause the malfunction, to increase the value of this parameter setting, but will reduce the sensitivity of the terminals.

F12.01	MCB X1 terminal function	000 - 155 [101]
F12.02	MCB X2 terminal function	000 - 155 [0]
F12.03	MCB X3 terminal function	000 - 155 [102]
F12.04	MCB X4 terminal function	000 - 155 [0]
F12.05	MCB X5 terminal function	000 - 155 [0]
F12.06	MCB X6 terminal function	000 - 155 [108]
F12.07	MCB X7 terminal function	000 - 155 [109]
F12.08	MCB X8 terminal function	000 - 155 [0]
F12.09	MCB X9 terminal function	000 - 155 [110]
F12.10	MCB X10 terminal function	000 - 155 [11]
F12.11	MCB X11 terminal function	000 - 155 [12]
F12.12	MCB X12 terminal function	000 - 155 [113]
F12.13	MCB X13 terminal function	000 - 155 [114]
F12.14	MCB X14 terminal function	000 - 155 [118]
F12.15	MCB X15 terminal function	000 - 155 [119]
F12.16	MCB X16 terminal function	000 - 155 [0]
F12.17	MCB X17 terminal function	000 - 155 [0]
F12.18	MCB X18 terminal function	000 - 155 [0]
F12.19	MCB X19 terminal function	000 - 155 [0]
F12.20	MCB X20 terminal function	000 - 155 [0]
F12.21	MCB X21 terminal function	000 - 155 [0]
F12.22	MCB X22 terminal function	000 - 155 [0]
F12.23	MCB X23 terminal function	000 - 155 [0]
F12.24	MCB X24 terminal function	000 - 155 [0]

Note:

1. X1 - X24 are digital input terminals and can select the corresponding function code 000 - 140, but the same function code can not be reused.

2. Hundreds is set as 0, it indicates the NO input. If set as 1, it indicates the NC input.

0: No function. To set the terminal in a non-functional state, even if there is a signal input, it will not make any action.

- Set the unused terminal as 0 so as to prevent misconnection or malfunction.

1: Up leveling NO input (DZU).

2: Down leveling NO input (DZD).

3: Door zone NO input (SX1).

- Via the leveling sensor signal to control the elevator leveling parking, and there are two way controls in accordance with different sensors.
  1): Three sensors (up leveling sensor, down leveling sensor, and door zone sensor): The up operation should successively receive the up leveling signal, the door zone signal and the down leveling signal. and the down operation should successively receive the down leveling signal, the door zone signal and the up leveling signal.
  2): Two sensors (up leveling sensor and down leveling sensor): The up operation should successively receive the up leveling signal and the down leveling signal. and the down operation should successively receive the down leveling signal and the up leveling signal.
- The door zone signal is used only in the open door re-leveling and advanced open function.
- If these three signals are abnormal (adhesion or disconnect), the system will alarm E0058 fault (leveling signal abnormal).

Note:

1. *If the elevator configures up and down two leveling sensors, you need connect these two sensor signals to the corresponding terminals, and these terminal functions are set as up leveling signal input (1 or 101) and down leveling signal input (2 or 102).*
2. *If the elevator configures one leveling sensor, there are the following two methods to achieve: 1) Connect the leveling sensor signal to the corresponding terminal, the terminal is set to door zone signal (3 or 103), while the up leveling signal function (1/101 set to 0) and the down leveling signal function (2/102 set to 0) have been set to cancel.*
   2) Connect the leveling sensor signal to two corresponding terminals, which are set to up leveling signal input (1/101) and the down leveling signal input (2/102).

4: Safety circuit 1 NO input (JT1).

5: Safety circuit 2 NO input (JT2).

6: Door locked circuit 1 NO input (DLC1).

7: Door locked circuit 2 NO input (DLC2).

- The safety circuit and the door locked circuit are enabled, which is an essential condition for elevator operation.
- **Safety circuit (No. 4 and No. 5 functions):** It is an important guarantee of the elevator safe and reliable operation. If select two safety circuit input points but any of them is broken off, it will alarm E0041 fault (safety circuit disconnection).
- **Door locked circuit (No. 6 and No. 7 functions):** It ensures that the hall door and the car door have closed at the elevator starting running. The function of door lock 2 is the same with that of door lock 1, that may handle hall door and car door signals separately. Two door locked signals are simultaneously connected to system before believe that the locks closed, otherwise alarm E0042 fault (door locked disconnection during running).

Note:

1. *No. 4 function and No. 5 function can use with the high voltage safety circuit signal. If using with the high voltage safety circuit, and detect that all safety circuits are valid, it will believe that the safety circuits pass, otherwise will alarm E0041 fault (safety circuit disconnection).*
2. *No. 6 function and No. 7 function can use with the high voltage door locked signal. If that, and detect the preset door lock signal circuits all turned on, it will believe the door lock closing. After door lock has closed, the LOCK lamp of MCB will become lighting.*

8: Run output feedback NO input (SW).

9: Brake output feedback NO input (BZK).

- The system automatically detect that the outputs of run contactor and brake contactor whether are consistent with the feedback signal.
- If inconsistent, it will alarm E0056 fault (run contactor feedback abnormal) and E0057 fault (brake contactor feedback abnormal).

10: Inspection NO input (INS).

11: Inspection up NO input (UP).

12: Inspection down NO input (DN).

- Turn the auto/inspection switch to inspection, the elevator enters to inspection mode and the INS lamp of MCB board will become lighting.
- At the inspection mode, the system will not operate automatically (including the automatic door). When there is inspection up signal or inspection down signal, the elevator will run at inspection speed (F04.00).

13: Up limit NO input (LSU).

14: Down limit NO input (LSD).

- No. 13 and No. 14 functions are terminal stopping switches for preventing car and counterweight rest when the elevator passed the leveling station of landing without stopping.

15: Locked-elevator NO input (LOCK).

- It is the locked-elevator signal input point and its function is the same as that of hall display board.

16: Over load NO input (LWD).

- If the elevator loading is over 110% of rated load, the system comes into over loading state.
- The over loading buzzer tweets, the car light of over loading lights and elevator doesn't close the door.
- In the elevator checking course, if the system need run with 110% over loading, it can set F25.04 Bit2 = 1 (enabled over-load run).

17: Full load NO input (LWX).

- The elevator loading among 80 - 110% of elevator rated load (F00.04) is full loading state.
- In the full loading state, the hall shows full loading, the elevator doesn't response the hall call.

18, 19: Up/Down forced 1 Dec. NO input (ULS1/DLS1).

20, 21: Up/Down forced 2 Dec. NO input (ULS2/DLS2).

22, 23: Up/Down forced 3 Dec. NO input (ULS3/DLS3).

- NL3000 system records these positions of switches into F19.12 - F19.17.

24: Fire signal NO input (FIRS1).

- When the "fire" switch is open, the elevator comes into fire state.
- At this mode, the system will cancel all entered hall call and car call. The elevator will park at the next station without opening the door. Elevator directly runs to the fire station and won'tn open door for setting passengers free until arriving at the fire station.

25: Fireman switch NO input (FIRS2).

- The fireman switch input point is used for fireman to run the elevator (twice fire control). At the fire back to base station, NL3000 will get into the fireman running state if there's fireman signal.

26: Front door light curtain NO input (EDP1).

27: Rear door light curtain NO input (EDP2).

- Use for light curtain signal normally input.

28: Battery-driven NO input (UPC).

- The NO input using for the power failure emergency run whether is valid, you can refer to the section 8.3.1 (page 179) about details.

29: Locked door output feedback NO input (FMFB).

- When the elevator opens the door in advance or re-leveling jumps out door lock after opening the door, it will detect locked-door feedback signal for insuring the elevator safely running.
- The system automatically detects whether the locked-door output is consistent with the feedback signal. If not, it will alarm E0047 fault (locked-door feedback abnormal).

30: Syn. motor self-locking feedback NO input (FX).

- The system automatically detects whether the synchronous star-delta contactor output is consistent with the feedback signal. If not, it will alarm E0054 fault (Syn. motor star-delta contactor feedback abnormal).

31: Motor over-heated NO input (MT).

32: Brake limit switch feedback NO input (BZK1).

- Use for detecting the actual action of brake. If the actual action is inconsistent with the brake output, it will alarm E0057 fault (brake contactor feedback abnormal).

33: Earthquake monitoring switch NO input (EQ).

34: Brake forced feedback NO input (KMZ).

35: Edges feedback for front door NO input (EDK1).

36: Edges feedback for rear door NO input (EDK2).

37: Half-load signal NO input (HALFLOAD).

38: Firefighting second base station NO input (SECONDFIRE).

39: Rear door prohibition NO input (DNA2).

40: Light load NO input (LWL).

41: Brake traffic switch feedback NO input 2 (BZK2).

- When the system is equipped with 2 brake mechanical feedback switches, one feedback signal is set to 32 or 132 according to NO or NC. The other feedback signal is set to 41 or 141 according to NO or NC.
- If the system is only equipped with a brake mechanical feedback switch, simply set the feedback signal to 32 or 132 according to NO or NC.

42 - 44: Reserved.

45: Bottom pit water protection (WAPR).

46: Door lock adhesive input.

47: Speed limiter feedback contact.

48: Automatic test run 3 hours input point.

49: Prohibit the express run input.

50: Bypass signal input.

When entering the door bypass function, the system has the following characteristics:

1. The keypad and operator report E0073 fault.

2. Cancel the opening and closing operation of the automatic door.

3. When the original system express train is running, it is close to the level.

4. During the automatic anti-leveling process, the elevator stops running immediately.

5. In the case of overhaul/emergency electric operation, the door door must be in place to start the operation.

6. The output is stopped immediately during the ultimate brake protection operation.

7. It is forbidden to run the elevator express train.

8. It is forbidden for the elevator to enter the well self-learning.

9. If the door closing signal is invalid during inspection/emergency motor operation, it will stop immediately.

In addition to the above features:

1. The new version of the car top plate increases the Y8 relay output. When the elevator is in the bypass signal, the Y8 signal has an output to control the sound and light signal warning function.

2. The old version of the car top board can be set to function No. 32 with the relays not used in Y1 - Y7 to realize the sound and light signal warning function.

51: Energy feedback fault signal input.

52: UPS fault signal input.

53: Emergency electric input.

54: Main switch off input.

55: UCM contactor feedback NO input.

F12.25	MCB X25 high voltage terminal function	0 - 5 [1]
F12.26	MCB X26 high voltage terminal function	0 - 5 [2]
F12.27	MCB X27 high voltage terminal function	0 - 5 [3]

0: No function.

1: High voltage safe circuit signal (JT).

2: High voltage locked door 1 signal (DS1).

3: High voltage locked door 2 signal (DS2).

4: The front door high pressure door lock is stuck.

5: The rear door high pressure door lock is stuck.

- The high-voltage terminal X28 of the new version of the control board can only be used as a high voltage door lock short-circuit signal, enabled by F26.14 Bit4.
- The X28 is generally required only when it has front and rear doors.

F12.28	MCB Y1 relay fuction	0 - 28 [1]
F12.29	MCB Y2relay fuction	0 - 28 [2]
F12.30	MCB Y3 relay fuction	0 - 28 [0]
F12.31	MCB Y4 relay fuction	0 - 28 [13]
F12.32	MCB Y5 relay fuction	0 - 28 [0]
F12.33	MCB Y6 relay fuction	0 - 28 [0]

0: No function. To set the terminal in a non-functional state and can not make any action.

1: Run contactor output (SW).

- The system outputs the run contactor's pick-up and release command. controls the run contactor's pick-up and release.

2: Brake contactor output (BZK).

- The system outputs the brake contactor's pick-up and release command so as to achieve the pick-up and release control of brake.

3: Locked door contactor output (FM).

- The system outputs the pick-up and release command of locked door contactor so as to achieve the locked-door jump out and release control at advanced open and OD re-leveling.

4: Synchronous star-delta contactor output (FX).

- The system outputs the pick-up and release command of run contactor. control the pick-up and release of synchronous star-delta contactor.
- It can be set by F26.19.
- The synchronous star-delta contactor can guarantee that the elevator does not occur high-speed car rolling even in the case of the brake failure.

5: Brake forced output (KMZ).

- Open the brake and last 4s each time. It can be used to control the starting voltage of the brake.

6, 7: Front door open/ close (OD1/ CD1)

8, 9: Rear door open/ close (OD2/ CD2).

- When there is only one door, it defaults that it is front door.

10: Lighting and fan output (FAN).

11: Error output (ERROR).

12: Power failure emergency run is enabled (UPC).

13: Fire linkage output (FIRE).

- At fire mode, the elevator will output the fire linkage signal after open the door straight on the fire base station.

14: Medical disinfection output (HOSPITAL).

15: Electric lock output (LOCK).

16: Non-door zone parking output (UNSTOP).

17: Non-service state output (OUTSERVICE).

18: Brake, run contactor output normally (BZKSWOK).

19: Integrated controller run output (RUN).

20: Up run signal output (UPRUN).

21: Down run signal output (DNRUN).

22: leveling area car illegally moved. (LayerMove).

23: Emergency operation complete (UPSOVER).

24: Emergency operation buzzer output (UPSBUZZ).

25: Speed governor output control.

26: Reserved.

27: Solenoid valve output.

28: External energy feedback fault reset output.

29: UCM contactor control signal.

F12.34 - F12.36	Manufacturer debugging parameter, prohibit to change	
F12.37	Emergency electric running speed	0.100 - 0.300 [0.100]

F12.38	Advanced parameter for manual door	0 - 65535 [12c3]

Bit0: Car and hall display when manual door locd disconnected

0: Normal display.

1: Manual door reminder display.

- When set to 1, when the car door is not closed, C and floor are displayed, and when the hall door is not closed, L and floor are displayed.

Bit3 - Bit1: Pull-up time of R-cam

Bit6 - Bit4: Off time of R-cam

000: 1s.

……

111: 8s.

Bit7: Door lock disconnection reminder condition of buzzer related to call order

0: When there is a call command, the door lock disconnect and the buzzer on.

1: Buzzer on when door lock disconnection.

Bit10&Bit9&Bit8: Action times of R-cam

000: 1 time.

……

111: 8 time.

Bit11: Semi-automatic door car door closing conditions

0: Normal close.

1: Closed after hall door lock connected.

- Used in the case where the car door is an automatic door and the hall door is a manual door. When the hall door is opened, the car door remains open. When the hall door is closed, the car door begins to close.

Bit12: Elevator valve output mode

0: Continouse output when closing door command valid.

1: Interval output when door closing command valid.

Bit14&Bit13: Manual door selection of front and rear door

00: Meaningless.

01: Automatic front door and manual rear door in double doors.

10: Manual front door and automatic rear door in double doors.

11: Meaningless.

Bit15: Reserved

7.2.14 F13: CTB Board Terminal Parameters

F13.00	CTB car command filter settings	00 - 99 [61]

Define the filter time of CTB input terminals (X1 - X8) and CCB interfaces (X1 - X8), used to set the sensitivity of the input terminals.

- As input terminals are vulnerable to interference and cause the malfunction, to increase the value of this parameter setting, but will reduce the sensitivity of the terminals.

Unit: CTB filter input settings

0: Filter time 4ms.
1: Filter time 10ms.
2: Filter time 20ms.
3: Filter time 30ms.
4: Filter time 40ms.
5: Filter time 50ms.
6: Filter time 60ms.
7: Filter time 70ms.
8: Filter time 80ms.
9: Filter time 100ms.

Ten: CCB filter input settings

0: Filter time 20ms.
1: Filter time 30ms.
2: Filter time 40ms.
3: Filter time 50ms.
4: Filter time 60ms.
5: Filter time 70ms.
6: Filter time 80ms.
7: Filter time 100ms.
8: Filter time 120ms.
9: Filter time 150ms.

F13.01	CTB X1 input terminal function	000 - 135 [101]
F13.02	CTB X2 input terminal function	000 - 135 [106]
F13.03	CTB X3 input terminal function	000 - 135 [102]
F13.04	CTB X4 input terminal function	000 - 135 [104]
F13.05	CTB X5 input terminal function	000 - 135 [103]
F13.06	CTB X6 input terminal function	000 - 135 [105]
F13.07	CTB X7 input terminal function	000 - 135 [7]
F13.08	CTB X8 input terminal function	000 - 135 [108]
F13.09	Input function of main COP CCB X1	000 - 135 [9]
F13.10	Input function of main COP CCB X2	000 - 135 [10]
F13.11	Input function of main COP CCB X3	000 - 135 [11]
F13.12	Input function of main COP CCB X4	000 - 135 [12]
F13.13	Input function of main COP CCB X5	000 - 135 [13]
F13.14	Input function of main COP CCB X6	000 - 135 [14]
F13.15	Input function of main COP CCB X7	000 - 135 [15]
F13.16	Input function of main COP CCB X8	000 - 135 [16]
F13.17	Input function of vice COP CCB X1	000 - 135 [18]
F13.18	Input function of vice COP CCB X2	000 - 135 [21]
F13.19	Input function of vice COP CCB X3	000 - 135 [23]
F13.20	Input function of vice COP CCB X4	000 - 135 [0]
F13.21	Input function of vice COP CCB X5	000 - 135 [0]

F13.22	Input function of vice COP CCB X6	000 - 135 [0]
F13.23	Input function of vice COP CCB X7	000 - 135 [0]
F13.24	Input function of vice COP CCB X8	000 - 135 [0]

Note: Hundreds is set as 0, it corresponds to NO input. If set as 1, it corresponds to normally close input.

For example: If set F13.01 as 102, it means that OD arrival normally close is enabled.

0: No function.

- To set the terminal in a non-functional state, even if a signal input does not make any action.
- Set the unused terminal as zero so as to prevent misconnection or malfunction.

1: Front door light curtain NO input (EDP1).

2: Front door OD arrival NO input (OLT1).

3: Front door CD arrival NO input (CLT1).

4: Rear door OD arrival NO input (OLT2).

5: Rear door CD arrival NO input (CLT2).

6: Rear door light curtain NO input (EDP2).

- When there is only one door, it defaults that it is front door.

7: Full load signal NO input (LWX).

8: Over load signal NO input (LWD).

9: OD button NO input (DOB1).

10: CD button NO input (DCB1).

11: OD delay button NO input (DDOB).

12: Direct arrival signal NO input (NSB).

13: Driver signal NO input (ATS).

14: Commutation signal NO input (ACB).

15: Isolated run signal NO input (ISS).

16: Fireman switch NO input (FIRS2).

17: Light load signal NO input (LWL).

18: Rear door OD button NO input (DOB2).

- The rear door OD button does as an open-through door control for two car call independently controlling front and back doors.

19: Edge signal for front door NO input (EDK1).

20: Edge signal for rear door NO input (EDK2).

21: Rear door CD button NO input (DCB2).

- The rear door CD button does as an open-through door control for two car call
- independently controlling front and back doors.
- The rear door CD button has effect on the front and back doors.

22: Open-through front/back door switch NO input (gABS).

- When the car call arrives, this terminal disables the front door but enables the back door.
- F26.21 = 1 (open-through door control opens), F22.17 = 2 (open-through door control mode 2), the No. 22 function will be enabled. Refer to section 8.3.2 Open-through Door (page 186).

23: Rear door OD delay button NO input (DDOB2).

24: Rear door prohibition NO input (DNA2).

25: Car call floor control (CaFl).

26: Manual fan control.

27: Start the VIP run in the car NO input.

- Use in conjunction with an hall VIP run.

28: Car door closed detection switch.

29: Inspection input.

30: Inspection up input.

31: Inspection down input.

32: The door motor is overheated.

33: Door area input.

34: Upper leveling input.

35: Lower leveling input.

F13.25	CTB Y1 relay function	0 - 34 [1]
F13.26	CTB Y2 relay function	0 - 34 [2]
F13.27	CTB Y3 relay function	0 - 34 [3]
F13.28	CTB Y4 relay function	0 - 34 [4]
F13.29	CTB Y5 relay function	0 - 34 [5]
F13.30	CTB Y6 relay function	0 - 34 [6]
F13.31	CTB Y7 relay function	0 - 34 [7]
F13.32	Output function of main COP CCB X1	0 - 34 [10]
F13.33	Output function of main COP CCB X2	0 - 34 [11]
F13.34	Output function of main COP CCB X3	0 - 34 [12]
F13.35	Output function of main COP CCB X4	0 - 34 [13]
F13.36	Output function of main COP CCB X5	0 - 34 [14]
F13.37	Output function of main COP CCB X6	0 - 34 [15]
F13.38	Output function of main COP CCB X7	0 - 34 [16]
F13.39	Output function of main COP CCB X8	0 - 34 [17]
F13.40	Output function of vice COP CCB X1	0 - 34 [18]
F13.41	Output function of vice COP CCB X2	0 - 34 [22]
F13.42	Output function of vice COP CCB X3	0 - 34 [23]
F13.43	Output function of vice COP CCB X4	0 - 34 [0]
F13.44	Output function of vice COP CCB X5	0 - 34 [0]
F13.45	Output function of vice COP CCB X6	0 - 34 [0]
F13.46	Output function of vice COP CCB X7	0 - 34 [0]
F13.47	Output function of vice COP CCB X8	0 - 34 [0]

0: No function.

- To set the terminal in a non-functional state, even if a signal input does not make any action.
- Set the unused terminal as zero so as to prevent misconnection or malfunction.

1, 2: Front door OD/ CD output (OD1/ CD1).

3, 4: Rear door OD/ CD output (OD2/ CD2).

5: Up arrival chime output (CHMUP).

6: Down arrival chime output (CHMDN).

7: Lighting and fan output (FAN). If any one of the following conditions is met, the lighting will be output.

- 1. Inspection operation.
- 2. Running with direction.
- 3. With fault.
- 4. Door machine in the switch door process or OD holding state.
- 5. Car has floor registration.

8: Buzzer output (BUZ). The conditions of buzzer output are as follows (this buzzer and the CCB buzzer output conditions are consistent).

- 1. To remind at excessive position deviation back to base station.
- 2. Hall call information remind at driver mode.
- 3. To remind at elevator over-loaded.
- 4. To remind at battery-driven.
- 5. To remind at forced close door.
- 6. To remind at firefighting back to base station.

9: Over load signal output (LWD).

10, 11: OD/CD button display (DOB1/ DCB1).

12: OD delay button display (DDOB).

13: Full load signal output (LWX).

14: Driver run signal (ATS).

15: Driver direction signal (ACB).

16: Isolated run display (ISS).

17: Fire run display (FIRE).

18: Rear door OD button display (DOB2).

19: Direct arrival output signal (NSB).

20: Up arrival chime forecast (CHMPUP).

21: Down arrival chime forecast (CHMPDN).

22: Rear door CD button display (DCB2).

23: Rear door OD delay button display (DDOB2).

24: Front door forced CD output (FCD1).

25: Rear door forced CD output (FCD2).

26: Arrival chime output (CHM).

27: Leveling area car illegally moved (LayerMove).

28: Reserved.

29: Timer output function.

- When F21.23 < system time <F21.24, this signal output is valid.

30: Reserved.

31: R-Cam output. The principle of action is as follows:

- In the maintenance state, the mechanical lock control output during operation. The mechanical lock control is disconnected during shutdown.
- In the automatic state: the mechanical lock control control output during operation. The mechanical lock is not output when the Dec. tostop in the leveling area, and the mechanical lock is not output during the stop.
- When returning to the leveling automatically, the mechanical lock is not output when decelerating to the door area, and the mechanical lock is not output when it is stopped, and there is output during other operations.

32: Bypass signal output reminder.

- For the new version: The car top plate Y8 relay function is fixed as an output bypass signal.
- For older versions: It can be defined by selecting the 32nd function from the car top plates Y1-Y7.

33: Red light output warning for door closing and opening.

34: Green light output warning for door open arrival.

F13.48	**CTB output logic**	**0 - 255 [0]**
F13.49	**Main/vice COP CCB output logic**	**0 - 65535 [0]**

F13.48 is 8-bit binary data. Bit0 is corresponding to CTB Y1, Bit7 is corresponding to CTB Y8.

F13.49 is 16-bit binary data. The low eight bits are corresponding to the main COP, the high eight bits are corresponding to the vice COP. The lowest bit of each eight bits corresponds to COP output X1, and the highest bit corresponds to COP output X8.

- Any bit is set as 1: Output logic is negated
- Any bit is set as 0: Output logic is normal.

7.2.15 F14: Communication Parameters

F14.00	Data format	0 - 5 [0]

0: 1-8-2 format, no parity, RTU.
1: 1-8-1 format, even parity, RTU
2: 1-8-1 format, odd parity, RTU.
3: 1-7-2 format, no parity, ASCII.
4: 1-7-1 format, even parity, ASCII.
5: 1-7-1 format, odd parity, ASCII.

F14.01	Baud rate selection	0 - 5 [3]

0: 1200bps.
1: 2400bps.
2: 4800bps.
3: 9600bps.
4: 19200bps.
5: 38400bps.

F14.02	Local address	0 - 247 [2]

F14.02 = 0, it represents the broadcast address.

F14.03	Host PC response time	0 - 1000 [0ms]

F14.04	Car call floor 16-1 controlling	0 - 65535 [65535]
F14.05	Car call floor 32-17 controlling	0 - 65535 [65535]
F14.06	Car call floor 48-33 controlling	0 - 65535 [65535]

F14.04 - F14.06 are composed of 16-bit binary. Each 1-bit binary represents 1 floor, and the status indicates low floor. F14.04 - F14.06 indicates whether the call floor 48 - 1 is regulated.

- 0: Controlled.
- 1: Not controlled.

F14.07	Host computer function parameters	0 - 65535 [1]

Bit0: PC connection selection

0: Communication is required without keypad.

1: Need keypad to communication.

Bit2 - Bit1: Parallel baud rate selection

00: 50k.

01: 125k.

10: 20k.

11: 10k.

Note: After modifying the baud rate, it needs to be powered off again to power up.

Bit3 - Bit15: Reserved

F14.08 - F14.09	Manufacturer debugging parameter, prohibit to change	
F14.10	Brake abnormal detection distance	6 - 9 [7cm]

7.2.16 F15: Keypad Display Parameters

F15.00	LCD keypad language	0, 1 [0]

0: Chinese.

1: English.

F15.01	LCD keypad display contrast	1 - 8 [6]
F15.02	Small keypad display direction	0 - 3 [0]

There are three LED digital tubes on the MCB board (NL3000-MCB-A) of NL3000.

F15.02 change the display direction of the digital tube. Regardless of whether the MCB board is installed positively or negatively, it is convenient to design the control panel.

0: Positive display, physical floor.

1: Reverse display, physical floor.

2: Positive display, hall call data.

3: Reverse display, hall call data.

- Positive display: The setting at positive installation of the MCB.
- Reverse display: The setting at negative installation of the MCB.
- Physical floor: The group F0 data of small keypad display is physical floor.
- Hall call data: The group F0 data of small keypad display is hall call data.

Note: Setting F15.02 as the physical floors or the hall call data can make the same to keypad display floor.

F15.03	Run display parameter 1 setting	0 - 9 [2]
F15.04	Run display parameter 2 setting	0 - 9 [3]
F15.05	Run display parameter 3 setting	0 - 9 [6]
F15.06	Run display parameter 4 setting	0 - 9 [0]
F15.07	Run display parameter 5 setting	0 - 9 [0]
F15.08	Run display parameter 6 setting	0 - 9 [0]
F15.09	Stop display parameter 1 setting	0 - 9 [2]
F15.10	Stop display parameter 2 setting	0 - 9 [0]
F15.11	Stop display parameter 3 setting	0 - 9 [7]
F15.12	Stop display parameter 4 setting	0 - 9 [0]
F15.13	Stop display parameter 5 setting	0 - 9 [0]
F15.14	Stop display parameter 6 setting	0 - 9 [0]

Define that the keypad displays the state parameter at running or stopping.

- Cyclically display via the key ◀ or key ▶ of keypad.
- Such as: When set F15.09 as 2, the stop display parameter is feedback speed at initial power.

0: Reserved.

1: Preset speed.

2: Feedback speed.

3: Output frequency.

4: Running RPM.

5: Output voltage.

6: Output current.

7: DC bus voltage.

8: AI input voltage.

- F05.01 = 2, display the analog input voltage of CTB.
- F05.01 = 3, display the analog input voltage of MCB.

9: Present height.

7.2.17 F16: Enhance Function Parameters

F16.00	Current keep time after stop command	0 - 500 [350ms]

To eliminate the Syn. motor current noise at stop, when the brake is over, the cut-off run signal will reduce the current to zero after some time.

- F16.00 setting time is the time reduced from motor rated current to zero.

F16.01	Fan control mode	0 - 3 [0]

Define the fan control mode.

- If alarm E0009 fault (heatsink overheated), the fan will run all the time.

0: Auto stop. The fan runs all the time in the running state. The fan will auto stop after stops for the time set by F16.02.

1: Immediately stop. The fan runs all the time in running state, when stops the fan will immediately stop.

2: Always run when power up.

3: Auto-control by module temperature.

F16.02	Fan control keep time	0.0 - 600.0 [300.0s]

F16.03	Braking unit action voltage	360 - 750V [Depend on model]

For 380V voltage, the braking voltage range is 630 - 750V and the factory setting is 720V.

For 220V voltage, the braking voltage range is 360 - 400V and the factory setting is 380V.

Note: Only in the controller running state, the braking action is enabled.

F16.04	Contactor fault detect time	0.3 - 3.0 [1.0s]

Define the fault detected time of output contactor, brake contactor, synchronous star-delta contactor and brake forced contactor.

F16.05	Fault shield	0 - 65535 [0]

Bit0: E0038 and E0039 fault shield

Bit1: E0024 fault shield

Bit2: E0058 fault shield

Bit3: E0059 fault shield

Bit4: E0045 fault shield

Bit5: Sincos CD break fault mask

Bit6: Sincos CD signal deviation shield

Bit7: UCMP E65 fault mask

Bit8: CIC-B communication fault shield

Bit9: Syn. motor auto-tuning with load encoder fault shield

0: Not shielded.

1: Shielded.

Bit10: Power off to reset E65, E66

0: E65, E66 can not be reset.

1: E65, E66 can reset.

Bit11: E0013 fault shield

Bit12: Shield bypass runningmonitor fault signal

Bit13: Shield clock chip read/write failure

0: Not shielded.

1: Shielded.

Bit12 - Bit15: Reserved

F16.06	Manual car fan running time	0 - 14400 [30s]
F16.07	Elevator manufacturer selection	0 - 999 [0]
F16.08 - F16.10	Manufacturer debugging parameter, prohibit to change	
F16.11	Sealed contactor fault detection time	0.3 - 7.0 [5.0s]

F16.11 sets the time for detecting the fault of the star-delta contactor. For the case that there is no externally-delayed delay circuit configuration, it can be appropriately reduced.

F16.12	Speed regulator starting time	50 - 5000 [500ms]
F16.13	Speed regulator ending time	50 - 5000 [500ms]
F16.14 - F16.24	Manufacturer debugging parameter, prohibit to change	

7.2.18 F17: Fault Protect Parameters

F17.00	The detect base of phase lack of input	0 - 100 [30%]
F17.01	The detect time of phase lack of input	0.0 - 5.0 [1.0s]

F17.00 setting value is a percentage of NL3000 rated voltage.

When detect certain input voltage without hitting the preset detect base (F17.00) and exceed the preset detect time (F17.01), it will alarm E0015 fault (lack of input).

- F17.00 = 0 or F17.01 = 0 or in the battery driven run mode, not detect the input phase loss fault

F17.02	The detect base of phase lack of output	0 - 100 [20%]
F17.03	The detect time of phase lack of output	0.0 - 20.0 [3.0s]

F17.02 setting value is a percentage of NL3000 rated current.

When detect certain output current without hitting the preset detect base (F17.02) and exceed the preset detect time (F17.03), it will alarm E0016 fault (lack of output).

- F17.02 = 0 or F17.03 = 0, not detect the output phase loss fault.

F17.04	Motor overload protect factor	20.0 - 110.0 [100.0%]

The motor overload protection factor can be set as 100% when NL3000 drives a motor with the same power class.

To protect the motor when the motor power is smaller than the standard matched power, you need to set a proper motor overload protect factor (F17.04). The factor can derive from the following formula.

For Asyn. motor:

$$\text{Motor overload protect factor (F17.04)} = \frac{\text{Asyn. motor rated current (F07.02)}}{\text{NL3000 rated current (D00.02)}} \times 100\%$$

For Syn. motor:

$$\text{Motor overload protect factor (F17.04)} = \frac{\text{Syn. motor rated current (F10.03)}}{\text{NL3000 rated current (D00.02)}} \times 100\%$$

F17.05	Auto reset times	0 - 100 [0]
F17.06	Auto reset interval	2.0 - 20.0 [5.0s/time]

This function can auto reset the fault in the running state in accordance with the preset times (F17.05) and interval (F17.06).

E0001: Controller output Acc. overcurrent	E0004: DC bus voltage Acc. overvoltage
E0002: Controller output Dec. overcurrent	E0005: DC bus voltage Dec. overvoltage
E0003: Controller output constant speed overcurrent	E0006: DC bus voltage constant speed overvoltage

When F17.05 = 0, it means "auto reset" is disabled.

- If no other fault is detected within 5 minutes, the auto reset count will be automatically cleared.
- On condition of external fault reset, auto reset count will be cleared.

F17.07	Fault advanced parameter	0 – 65535 [0]

Bit0: Fault relay action selection during automatic reset ing

Bit1: Fault relay action selection during undervoltage

- 0: Not act.
- 1: Acts.

Note: The MCB board relay needs to be used (F12.28 - F12.33) set to function No. 11 (fault output) function.

Bit2: When the elevator starts, the brake switch is automatically reset

0: Automatically reset 3 times.

1: Not automatically reset.

Bit3: E66 fault can be manually reset

- 0: Cannot be reset manually.
- 1: Can be reset manually.

Bit4: Three phase input line voltage phase loss detection

0: Detection.

1: Not detected.

Bit5 - Bit15: Reserved

F17.08	Type of the 1st fault (the farthest time)	[Actual value]
F17.10	Type of the 2nd fault	
F17.12	Type of the 3rd fault	
F17.14	Type of the 4th fault	
F17.16	Type of the 5th 5 fault	
F17.18	Type of the 6th fault	
F17.20	Type of the 7th fault	
F17.22	Type of the 8th fault	
F17.24	Type of the 9th fault	
F17.26	Type of the 10th fault	
F17.09	Time of the 1st fault (month&day)	
F17.11	Time of the 2nd fault (month&day)	
F17.13	Time of the 3rd fault (month&day)	
F17.15	Time of the 4th fault (month&day)	

F17.17	Time of the 5th fault (month&day)	
F17.19	Time of the 6th fault (month&day)	[Actual value]
F17.21	Time of the 7th fault (month&day)	
F17.23	Time of the 8th fault (month&day)	
F17.25	Time of the 9th fault (month&day)	
F17.27	Time of the 10th fault (month&day)	
F17.28	The latest fault type	
F17.29	The latest fault y (month&day)	
F17.30	The latest fault time (hour minute)	
F17.31	The latest fault running speed	
F17.32	The latest fault DC bus voltage	
F17.33	The latest fault output current	

F17.08 - F17.33 record the elevator's recent 11 fault code, elevator floor where the fault occurs, and fault time.

- Fault type, meaning and countermeasure refer to section 9.1 Troubleshooting, page 194.

The fault information is composed of four bits, the high two bits represent the elevator floor where the fault occurred, and the low two bits represent the fault type.

7.2.19 F18: PWM Control Parameters

F18.00	Carrier frequency	1 - 16kHz [Depend on model]

Define the carrier frequency of NL3000 output PWM wave.

The F18.00 value is is closely related to the motor running noise. Generally set above 6 kHz, you can achieve quiet operation.

NL3000 Power Class	Setting Range	Factory Setting
0.2 - 22kW	1 - 16kHz	8kHz
30 - 45kW	1 - 12kHz	6kHz

- The greater F18.00 is, the lower the loss and temperature in the motor is, but the larger the system loss and interference is, and the higher the temperature is.
- The smaller F18.00 is, the higher the loss and temperature in the motor is, and the greater the higher harmonic component of the output current is.
- When the F18.00 is higher than the factory setting, NL3000 should be derated by 5% when per 1kHz is increased compared to the factory setting.

F18.01	Carrier frequency auto adjust enable	0, 1 [0]
F18.02	PWM over-modulation enable	0, 1 [1]

0: Disabled.

1: Enabled.

F18.03	PWM modulation mode	0, 1 [1]

0: Two phase modulation and three phase modulation switch.

1: Three phase modulation.

7.2.20 F19: Distance Control Parameters

F19.00	Total floor	2 - 48 [30]

Define the total number of floors.

F19.01	Present floor	1 - F19.00 [1]

Define the present physical floor of car.

- The system can automatically change F19.01 when elevator is running. And the system can automatically revise F19.01 after the up or down forced Dec. switch is touching off.
- When elevator is in non-bottom or non-top floor, can manually change F19.01. But this parameter must accord with the present floor.

F19.02	Present height	0.00 - 299.99 [0.00m]

Define the number of pulse that the present floor relative to the lowest leveling floor.

F19.03	Leveling distance adjustment / Parking allowance of distance control	0 - 60 [30mm]

NL3000 have built-in advanced distance control algorithm, and use a variety of ways to ensure direct parking stability, generally need not be adjusted.

- F19.06 = 0 (direct parking mode 0), F19.03 is the leveling distance adjustment. changing F19.03 can adjust the elevator leveling accuracy.
  - If elevator is over leveling when stops, reduce the value of F19.03. If elevator is under leveling when stops, increase it.
- F19.06 = 1 (direct parking mode 1), F19.03 is the parking allowance of distance control.
  - Increase F19.03, the creeping distance will increase. reduce F19.03, the creeping distance will reduce.
  - If elevator is over leveling when stops, increase the F03.13 (stop Dec. jerk). If elevator is under leveling, reduce it.

F19.04	Leveling position correction coefficient	0 - 750 [0mm]

F19.04 is related with the length of leveling plate, but not the actual length of leveling plate.

- It is noted when shaft self-learning, the user need not change.
- The data such as the length of leveling plate can be checked via D06.06 - D06.08.

F19.05	Dec. point through output adjustment	0.050 - 2.000 [0.250s]

This is the distance control internal Dec. signal, which need not be changed by users.

F19.06	Direct parking selection	0, 1 [0]

Define the direct parking mode of elevator.

0: Direct parking mode 0 (without creep).

- To the principle of distance, automatically generate a smooth curve from start to park, no creep, directly stops in leveling position.

1: Direct parking mode 1 (with creep).

- To the principle of distance, automatically generate a smooth curve from start to park, with creep distance of 30mm (F19.03), decelerates at F03.13 (stop Dec. jerk) and stops in the leveling position when encounters the leveling signal.
- Refer to the figure of F03.13 for the detail.

F19.07	Highest speed of curve 1	0.000 - F00.02 [0.000m/s]
F19.08	Highest speed of curve 2	0.000 - F00.02 [0.000m/s]
F19.09	Highest speed of curve 3	0.000 - F00.02 [0.000m/s]
F19.10	Highest speed of curve 4	0.000 - F00.02 [0.000m/s]
F19.11	Highest speed of curve 5	0.000 - F00.02 [0.000m/s]

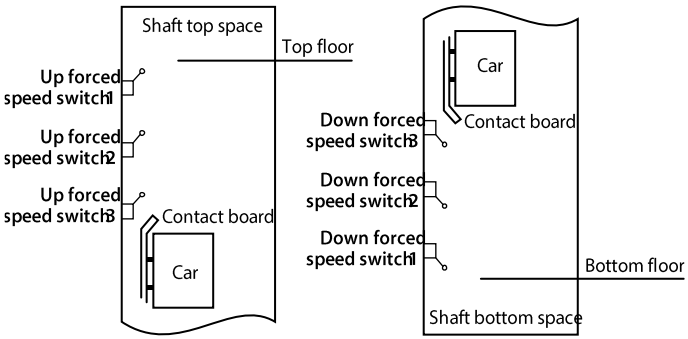
F19.07 - F19.11 can only be checked but not to changed by the user due to the MCB board software version is V1.07 or above.

After the shaft self-learning or changed the Acc. / Dec. curve, the system will generate a running speed curve of F19.07 - F19.11 in accordance with the floor data and the elevator Max. running speed (F00.02) etc.

F19.12	Up forced Dec. 1 position	0.00 - 300.00 [0.00m]
F19.13	Down forced Dec. 1 position	0.00 - 300.00 [0.00m]
F19.14	Up forced Dec. 2 position	0.00 - 300.00 [0.00m]
F19.15	Down forced Dec. 2 position	0.00 - 300.00 [0.00m]
F19.16	Up forced Dec. 3 position	0.00 - 300.00 [0.00m]
F19.17	Down forced Dec. 3 position	0.00 - 300.00 [0.00m]

F19.12 - F19.14 define that all level forced Dec. switches are relative to the position of the bottom leveling floor, which can be automatically recorded during shaft self-learning process.

- M NL3000 can set 3 pairs of switches of forced Dec. at most. Its setting position is: the sequence is followed by the installation of NO.1, NO.2, and NO.3 forced Dec. switches from the end to the middle of the well. As following figure.
- In the low-speed elevator, there may be only one pair of forced Dec. switches. And there are two or three pairs of forced Dec. switches in the high-speed elevator.



- S is the installing distance between forced Dec. switch and station leveling position, of which formula is as following, and refer to below table for detail.

$$S > \frac{V^2}{2 \times F03.12}$$

Elevator Rated Speed (F00.03)	No. 1 Switch	No. 2 Switch	No. 3 Switch
V≤1.75m/s	1.3 - H/2m		
1.75<V≤2.5m/s	1.3m	3.2m	
2.5<V≤4.0m/s	1.3m	3.2m	8.0m

  - In the table, H indicates the landing height, because forced Dec. 1 (F04.06) will reset terminal station floor display, No. 1 forced Dec. switch and the below can only have one leveling plate. otherwise it will split.
  - In the table, the installing distances are calculated under the condition that the Acc. / Dec. are 0.600m/s^2, and the forced Dec. speed (F03.12) is 1.000m/s^2.
- The system can automatically monitor the instant running speed when elevator runs to the forced Dec. switch. If detect the abnormal speed or position, the system will forcedly decelerate at F03.12 (forced Dec. speed) to avoid climbing or plunging elevator.
- If F19.12 - F19.14 is set too small, the system will alarm E0060 fault (forced Dec. and distance is too short). It can be solved through adjusting the installing position of forced Dec. switch or increasing the parameter F03.12 (forced Dec. speed).
- If F03.12 is set too big and the braking resistor capacity is low, it may cause a slowdown overvoltage fault.

7.2.21 F20: Storey Height Parameters

F20.00	High bit of storey 1	0 - 50000 [0]
F20.01	Low bit of storey 1	0 - 50000 [0]

Define the height from the first floor to the second floor. Unit: Pulse number.

- **The storey height is:** 50000 × F20.00 + F20.01.

F20.02	High bit of storey 2	0 - 50000 [0]
F20.03	Low bit of storey 2	0 - 50000 [0]
……	……	0 - 50000 [0]
F20.90	High bit of storey 46	0 - 50000 [0]
F20.91	Low bit of storey 46	0 - 50000 [0]

Define the height from the present floor N to floor N + 1.

- **The relationships of high/low bit of storey N and the parameter number are:**
  - Parameter number of storey high bit = 2N - 2.
  - Parameter number of storey low bit = 2N - 1.
- **The storey height is:**
  - 50000 × High bit of storey + Low bit of storey.

F20.92	High bit of storey 47	0 - 50000 [0]
F20.93	Low bit of storey 47	0 - 50000 [0]

Define the height from the 47th floor to the 48th floor. Unit: Pulse number.

- **The storey height is:** 50000 × F20.92 + F20.93.

7.2.22 F21: Elevator Parameters

F21.00	Parking base station	1 - F19.00 [1]

Define the elevator will automatically return to the physical floor when the elevator idle time is excess F23.00 (free return base station time).

F21.01	Fire base station	1 - F19.00 [1]

Define the elevator will return to the physical floor when the elevator enters the fire back base station of running mode.

F21.02	Locked-elevator base station	1 - F19.00 [1]

Entering the locked-elevator mode, the elevator will return to the physical floor after responds the COP command.

F21.03	VIP floor	0 - F19.00 [0]

Define the VIP service physical floor of elevator.

- When there is hall call of VIP service floor, the elevator will eliminate all other calls, only in response to the call of the VIP floor. When VIP service is over, the elevator will be at normally running.

F21.04	Offset real floors	0 - 48 [0]

At the parallel or group control, define the lowest floor difference value between the present elevator and all elevators of the entire group control.

- At single elevator operation (F21.05 = 1), set F21.04 as 0.
- At two elevator parallel operation (F21.05 - 2) or group control (F21.05 = 3 - 8), if the lowest floor of every elevator is different, it must set F21.04.

F21.05	Group control number	1 - 8 [1]

1: Single elevator operation.

2: Two elevator parallel operation.

3 - 8: Group control operation. Should use with group control board (NL3000-GCB-A).

F21.06	Elevator number	1 - 8 [1]

- Set F21.05 = 1, F21.06 is invalid.
- Set F21.05 = 2, number 1 (F21.06 = 1) is as the main elevator, and 2 (F21.06 = 2) is as the vice elevator.
- Set F21.05 = 3 - 8, F21.06 will be set according to the elevator actual number, please refer to "NL3000-GCB-A Group Control Board User Manual".

F21.07	Service floor 1	0 - 65535 [65535]
F21.08	Service floor 2	0 - 65535 [65535]
F21.09	Service floor 3	0 - 65535 [65535]

Define the floor that the elevator can serve.

- F21.07 sets the elevator on the 16 - 1 physical floors which can serve.
- F21.08 sets the elevator on the 32 - 17 physical floors which can serve.
- F21.09 sets the elevator on the 48 - 33 physical floors which can serve.

Such as: F21.07 is 16-bit binary data. Its lowest bit is corresponding to the first physical floor, and its highest bit is corresponding to the 16th floor.

- Any bit is set as 1: The corresponding floor is the service floor and allowing to park.
- Any bit is set as 0: The corresponding floor is the non-service floor and not allowing to park. This floor can not register the calling elevator command.

Note: The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers.

F21.10	Time-sharing service 1 start time	00:00 - 23:59 [00:00]
F21.11	Time-sharing service 1 end time	00:00 - 23:59 [00:00]
F21.12	Time-sharing service 1 floor 1	0 - 65535 [65535]
F21.13	Time-sharing service 1 floor 2	0 - 65535 [65535]
F21.14	Time-sharing service 1 floor 3	0 - 65535 [65535]
F21.15	Time-sharing service 2 start time	00:00 - 23:59 [00:00]
F21.16	Time-sharing service 2 end time	00:00 - 23:59 [00:00]
F21.17	Time-sharing service 2 floor 1	0 - 65535 [65535]
F21.18	Time-sharing service 2 floor 2	0 - 65535 [65535]
F21.19	Time-sharing service 2 floor 3	0 - 65535 [65535]

F21.10 - F21.19 define two groups timesharing service periods and the corresponding physical floor.

- The time-haring service floors are set by F21.12 - F21.14 and F21.17 - F21.19. The setting ways should be refered to F21.07 - F21.09.
  - F21.12 / F21.17 sets floor 16 – 1, F21.13 / F21.18 sets floor 32 - 17, F21.14 / F21.19 sets floor 48 - 33.
- When F21.10 = F21.15 and F21.11 = F21.16, only F21.12 - F21.14 (time-sharing service 1 floor) are valid.
- When the start time and the end time of timesharing are the same, the timesharing service will not work.

Note: The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers.

F21.20	Peak 1 start time	00:00 - 23:59 [00:00]
F21.21	Peak 1 end time	00:00 - 23:59 [00:00]
F21.22	Peak 1 floor	1 - F19.00 [1]
F21.23	Peak 2 start time	00:00 - 23:59 [00:00]
F21.24	Peak 2 end time	00:00 - 23:59 [00:00]
F21.25	Peak 2 floor	1 - F19.00 [1]

F21.20 - F21.25 define two groups of peak time and corresponding peak floor.

- During the peak time, if the car call number of peak floor is larger than 3, it will enter into peak state.
- At the moment, the car call of peak floor will be valid all the time, and the entering peak state elevator at free time will return to this floor as soon as possible.

Note: When F26.10 = 1 (open peak service), it will be valid.

F21.26	Down-collective 1 start time	00:00 - 23:59 [00:00]
F21.27	Down-collective 1 end time	00:00 - 23:59 [00:00]
F21.28	Down-collective 2 start time	00:00 - 23:59 [00:00]
F21.29	Down-collective 2 end time	00:00 - 23:59 [00:00]

Define the work time of two group down-collectives.

During this time, the elevator only responds the down run command.

F21.30	Up-collective 1 start time	00:00 - 23:59 [00:00]
F21.31	Up-collective 1 end time	00:00 - 23:59 [00:00]
F21.32	Up-collective 2 start time	00:00 - 23:59 [00:00]
F21.33	Up-collective 2 end time	00:00 - 23:59 [00:00]

Define the work time of two group up-collectives.

During this time, the elevator only responds the up run command.

7.2.23 F22: Door Machine Parameters

F22.00	Door motor number	1, 2 [1]

Define the door motor number. Please set this parameter in accordance with the actual door motor number used by the elevator.

- When the elevator only has one door, the door will default as the front door. When the elevator has two doors, the doors will be divided into front door and back door.

F22.01	Front door service floor 1	0 - 65535 [65535]
F22.02	Front door service floor 2	0 - 65535 [65535]
F22.03	Front door service floor 3	0 - 65535 [65535]

Define the physical floor of front door service.

- The front door service floors are set by F22.01 - F22.03, and the setting ways are refered to F21.07 - F21.09 (service floors 1 - 3).
  - F22.01 sets floor 16 - 1. F22.02 sets floor 32 - 17. F22.03 sets floor 48 - 33.
  - Any bit is set as 1: The front door of corresponding floor can open and close.
  - Any bit is set as 0: Disable the front door of corresponding floor to open door.

Note:

1. The settings of F22.01 - F22.03 should not conflict with the settings of F21.07 - F21.09, the user must ensure that the elevator door motor service floor (F21.07 - F21.09) is the system service floor

2. The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers.

F22.04	Rear door service floor 1	0 - 65535 [65535]
F22.05	Rear door service floor 2	0 - 65535 [65535]
F22.06	Rear door service floor 3	0 - 65535 [65535]

Define the rear door service floor.

- Refer to parameters F22.01 - F22.03 for details.

Note:

1. The rear door service will be valid when F22.00 = 2.

2. The LCD keypad will automatically display the significance of each binary number which only needs to be set, and therefore it need not convert all binary numbers into decimal numbers

F22.07	OD time protection	5 - 99 [10s]
F22.08	CD time protection	5 - 99 [15s]
F22.09	Limited times of OD/CD overtime	0 - 20 [0]

Outputting OD/CD command and after the setting time of F22.07 (OD) / F22.08 (CD), the system does not receive the OD/CD arrival feedback signal yet, the elevator will immediately turn to close /open the door, which is the switching gate time.

- When OD/CD number of times is consistent with the setting of F22.09, it will alarm E0048 fault (OD fault) / E0049 fault (CD fault).
- When F22.09 = 0, no OD/CD time protection. If no OD/CD arrival signal is received during the system OD/CD process, it will continue to open door/close door.

F22.10	OD/CD torque holding	0 - 4 [3]

Define the system selection of torque holding during elevator opening/closing the door.

0: Without OD/CD torque holding.

1: With OD torque holding.

2: With CD torque holding.

3: With OD/CD torque holding.

4: Run process with CD torque holding.

F22.11	Hall call OD holding time	1 - 30 [5s]
F22.12	Car call OD holding time	1 - 30 [3s]

F22.11 defines the time of holding open door with hall call but without car call.

F22.12 defines the time of holding open door with car call.

- If there is CD command input within the OD holding time, the CD command will be immediately responded.

F22.13	Door state at waiting elevator	0 - 2 [0]

Define the elevator door state at spare time.

0: Normal closes the door.

1: Base station OD waiting elevator.

2: Each floor OD waiting elevator.

F22.14	Holding time for base station OD	1 - 30 [10s]
F22.15	Delay time of OD holding	10 - 1000 [30s]

F22.14 defines the holding OD time after the elevator arriving to the base station.

F22.15 defines the elevator holding OD time when there is OD delay signal input.

- If there is CD command input within the setting time, the CD command will be immediately responded.

F22.16	Arrival chime output time	0 - 10 [0s]

0: Always output at arrival.

1 - 10: Output pulse signals for 1 - 10s seperately.

F22.17	Open-through door control mode	0 - 3 [0]

Define the open-through door control modes.

- Refer to section 8.3.4 Description of Over-load and Full-load, page 191.

0: Open-through door control mode 0.

1: Open-through door control mode 1.

2: Open-through door control mode 2.

3: Open-through door control mode 3.

F22.18	Arrival chime delay time	0 - 10000 [0ms]

When the F22.18 is greater than 10 and the elevator displays the floors for the purpose of switch, the arrival chime will be output after the setting time of F22.18.

When the F22.18 is smaller than 10, the arrival chime will be output at stopping.

7.2.24 F23: Time Parameters

F23.00	Free return base station time	0 - 240 [10min]

Define that the elevator automatically returns to parking base station after F23.00 without car call, hall call or any other call.

- Set F23.00 as 0, not back to base station.

F23.01	Delay time of close lighting and fan	0 - 240 [2min]

Define that the elevator automatically cut off the car lighting and fan power in automic state without running command and after F23.01 setting time.

- Set F23.01 = 0, no close delay function.

F23.02	Largest floors run interval	0 - 45 [45s]

When elevator running time is over the F23.02 at border upon floors and there is no leveling signals, elevator will alarm E0040 fault (elevator run timeout).

- If F23.02 < 3s, no protection.

F23.03	Clock: year	2000 - 2100[Actual value]
F23.04	Clock: month	1 - 12[Actual value]
F23.05	Clock: day	1 - 31[Actual value]
F23.06	Clock: hour	00 - 23[Actual value]
F23.07	Clock: minute	00 - 59[Actual value]
F23.08	Clock: second	00 - 59[Actual value]

F23.03 - F23.08 are used to set the present time, and normal timing after power down.

Note: In the elevator for the first time on the power, first check F23.03 - F23.08. According to these time parameters, NL3000 completes the time-related functions, such as peak services etc.
If the time is not right, please reset the relevant parameters.

7.2.25 F24: Display Floor Information Parameters

F24.00	Collective mode	0 - 2 [0]

0: Full collective. The elevator responds the up and down running call outside the hall.

1: Up collective. The elevator responds the up running call outside the hall but not responds the down running call.

2: Down collective. The elevator responds the down running call outside the hall but not responds the up running call.

F24.01	Floor 1 display	0000 - 1999 [1901]
F24.02	Floor 2 display	0000 - 1999 [1902]
……	……	0000 - 1999 [……]
F24.09	Floor 9 display	0000 - 1999 [1909]
F24.10	Floor 10 display	0000 - 1999 [0100]
……	……	0000 - 1999 [……]
F24.19	Floor 19 display	0000 - 1999 [0109]
F24.20	Floor 20 display	0000 - 1999 [0200]
……	……	0000 - 1999 [……]
F24.46	Floor 46 display	0000 - 1999 [0406]
F24.47	Floor 47 display	0000 - 1999 [0407]
F24.48	Floor 48 display	0000 - 1999 [0408]

Define the display content of outside hall and inside car display board of corresponding floor.

- The settings are consisted by four bits, two high bits represent tens of floors and two low bits represent units of floors.
- The meanings of two high and low bits of setting are as following table:

Such: The 15th floor displays 15, F24.15 = 0105. The first floor displays -1, F24.01 = 1801.

Setting	Display	Display	Display	Display	Display	Display	Display
00	0	10	A	21	13	33	S
01	1	11	B	22	23	34	T
02	2	12	G	23	C	35	U
03	3	13	H	24	D	36	V
04	4	14	L	25	E	37	W
05	5	15	M	26	F	38	X
06	6	16	P	27	I	39	Y
07	7	17	R	28	J	40	Z
08	8	18	-	29	K	41	LB
09	9	19	No display	30	N	42	1/2
		20	12	31	O	43	LG
				32	Q	44 - 99	No display

7.2.26 F25: Test Running Parameters

Group F25 parameters are especially enacted for elevator adjustment. The setting of parameters won't be saved after power failure, and it will return to default.

Note: group F25 can only be set by the professional person, which should be with caution. Otherwise the resulting consequences are undertaken by the persons who set up on their own, hereby declare. Please make sure that each parameter of group 25 is set as zero during the elevator normal operation.

F25.00	Test floor 1	0 - F19.00 [0]
F25.01	Test floor 2	0 - F19.00 [0]
F25.02	Test floor 3	0 - F19.00 [0]

Define the target floor when the elevator is in testing operation.

- F25.00 - F25.02 are the same with the car call commands. The command is durative availability until code is set to 0 instead or power is failure
- Set as 0, no testing floor.

F25.03	Test times	0 - 60000 [0]

F25.03 defines the testing operation times.

- Set as 60000, it will run all the time.
- When set as other value, the elevator will not stop testing operation until the running times reach the setting value.

F25.04	Special test parameter	0 - 65535 [0]

Bit0: Hall call enable

0: Enabled.

1: Disabled. The MCB does not communicate with HCB, the hall call elevator signal is invalid and the HCB displays E52.

Bit1: OD enable

0: Enabled. The OD/CD buttons are normal.

1: Disabled. The OD/CD buttons are un-useful and doors don't automatically open.

Bit2: Over-load enable

0: Disabled

1: Enabled. After the elevator reaches the over-load and there is no over-loaded protection, it will run in accordance with the full load state.

Bit3: Limitation enable

0: Enabled.

1: Disabled. It only can be used in detecting the limitation switch.

Bit4: Random run enable

0: Disabled.

1: Enabled. According to the internal random function, the controller can randomly assign the hall call registration command between the first floor and the highest floor.

Bit5: Test running for 3 hours in each layer

Bit6: Analog overload switch action

0: Disabled

1: Enabled

Bit7: Start UCMP test

Bit8: Start brake brake force test

0: Disabled.

1: Enabled.

Bit9 - Bit15: Reserved

F25.05	Parallel automatic return to base station time	10 - 9999 [60s]
F25.06	Set days of maintenance	1 - 99 [15 day]

F25.07	CIC-B parameter setting	0 - 65535 [18]

Bit0: CIC-B function enabled

0: Disabled.

1: Enabled.

Bit2&Bit1: Max. number of reminders for elevator fault messages

00: One reminder.

01: Two reminders.

10: Three reminders.

11: Four reminders.

Bit3: Interval time of elevator fault SMS reminder

0: One hour interval.

1: Two hour interval.

Bit4: SMS reminder of maintenance time arrvial

0: Disabled.

1: Enabled. When the accumulated running time of the elevator exceeds F25.06, a text message reminder will be provided. After the inspection mode is changed to the normal operation mode, the system operation time is re-timed.

Bit5: SMS reminder of elevator fault

0: Enabled.

1: Disabled.

Bit6 - Bit15: Reserved

7.2.27 F26: Elevator Function Selections

F26.00	Call elevator floor setting	0 - F19.00 [0]

When use for debugging elevator, calling elevator via keypad is the same with the car call floor command registration.

F26.01	Shaft self-learning	0 - 4 [0]

0: Does not work.

1: Start shaft self-learning (not clear F27.01 - F27.25).

2: Start shaft self-learning (clear F27.01 - F27.25).

3: Automatic back to base floor automatically start shaft self-learning (not clear F27.01-F27.25).

4: Automatic back to base floor automatically start the shaft self-learning (clear F27.01-F27.25).

F26.02	Driver function	0 - 65535 [275]

Bit0: Open driver function

0: Without driver function.

1: With driver function.

Bit2&Bit1: Hall call disposal at driver mode

00: Buzzer no action, car call no flashing.

01: Buzzer no action, car call flashing.

10: Buzzer action, car call no flashing.

11: Buzzer action, car call flashing.

Note: When the car call and hall call are valid at the same floor, the car display defaults 00 (buzzer no action, car call is not flashing).

Bit3: CD arrival without registration command and auto open door

0: Auto open door.

1: Do not auto open door.

Bit4: Parallel/group control at driver mode

0: Can parallel group control.

1: Out off parallel group control.

Bit5: Enter driver clearing the call signal

0: For the first time enter driver mode without clearing car/hall call signal.

1: For the first time enter driver mode clearing car/hall call signal.

Bit6: Driver mode response the hall call

0: Response the hall call.

1: Not response the hall call (inside the car just flashing).

Bit7: Modes of close the door

0: To close the door via long pressing the closed button.

1: Jog to close the door.

Bit8: Lock-elevator in driver mode

0: Do not lock the elevator.

1: Normally lock elevator.

Bit9: Manual door closes automatically

0: Manual door software automatically closes inside.

1: Close the door by closing button.

Bit10: Manual door mode 2 enabled

0: Disabled.

1: Enabled.

Bit11: Manual door energy saving mode

0: Normal.

1: New energy saving method.

Bit12: Door close arrival judged by manual door lock

0: By door closing time.

1: By door lock on.

Bit13: Reserved

Bit14: During the closing arrival, the upper and lower leveling is out of an anti-leveling floor processing

0: Not handled.

1: Anti-leveling floor processing.

Bit15: Manual fan mode selection

0: Press the button fan to run, then press the button to stop the fan.

1: Press the button on the fan to run, stop after executing time set by F16.06.

Remarks: Bit9 - Bit15 function is independent of the driver mode.

F26.03	Firefighting function	0, 1 [1]
F26.04	OD re-leveling function	0, 1 [0]
F26.05	Advanced open function	0, 1 [0]

F26.03 - F26.05 define the corresponding function selection.

0: Without corresponding function.

1: With corresponding function.

Note: The re-leveling function and the advanced open function should be equipped with the advanced open block (NL3000-AOB-A).

F26.06	VIP floor function	0, 1 [0]
F26.07	Isolated run	0, 1 [0]

Defines the choice of features or services.

0: No open.

1: Open.

F26.08	Elevator function parameters 5	0 - 65535 [0]

Defines the function selection of the car top X9-X14 terminals.

Bit2 - Bit0: CTB board X9 function selection

000: Leveling input function is not enabled.

001: Up leveling NO input.

010: Up leveling NC input.

011: Door area is NO.

100: Door area is NC.

101, 110, 111: Meaningless.

Bit3: Reserved

Bit6 - Bit4: CTB board X10 function selection

000: Leveling input function is not enabled.

001: Down leveling NO input.

010: Down leveling NC input

011: Door area is NO.

100: Door area is NC

101, 110, 111: Meaningless.

Bit7: Reserved

Bit9&Bit8: CTB board X11 function selection

00: Leveling input function is not enabled.

01: Inspection up NO input.

10: Inspection down NO input.

11: Meaningless.

Bit11&Bit10: CTB board X12 function selection

00: Inspection down input function is not enabled.

01: Inspection down NO input.

10: Inspection down NC input.

11: Meaningless.

Bit13&Bit12: CTB board X13 function selection

00: Door motor over-heat detection is not enabled.

01: Door motor over-heat NO input.

10: Door motor over-heat NC input.

11: Meaningless.

Bit15&Bit14: CTB board X14 function selection

00: Inspection input function is not enabled.

01: Inspection NO input.

10: Inspection NC input.

11: Meaningless.

F26.09	Elevator function parameters 6	0 - 65535 [0]

Bit0: Down-collective service

Bit1: Up-collective service

Bit2: Peak service

0: No open.

1: Open.

Bit3: Firefighting service

0: No function.

1: Have function.

Bit4: Open door releveling function

Bit5: Opening the door in advance

Bit6: VIP layer function

Bit7: Independent operation

0: No open.

1: Open.

Bit8: Leveling buzzer

0: On.

1: Off.

Bit9 - Bit15: Reserved

F26.10	Elevator function parameters 7	0 - 65535 [0]
F26.11	Miss delete car command	0 - 3 [1]

0: No open.

1: Double-click to cancel floor command.

2: Long press to cancel floor command.

3: Click Cancel Floor Instructions.

F26.12	Inspection parameter setting	0 - 65535 [61]

Bit0: Inspection auto close door

0: Inspection without close door.

1: Inspection auto close door.

- At inspection operation, press the up/down run button, the elevator will automatically close the door. otherwise, will not output close door signal.

Bit1: Inspection run over-current detection

0: Without limiting 110% rated current.

1: With limiting 110% rated current.

Bit2: Stop mode selection at inspection

0: Immediate stop.

1: Dec. stop.

Bit3: Detect door lock jump-out fault at inspection mode

Bit4: Detect up/down forced simultaneous operation at inspection mode

Bit5: Detect open/close door simultaneous operation at inspection mode

0: Detect.

1: Do not detect.

Bit6: Door machine non-service floor allow open/close door at inspection

0: Do not allow open/close door.

1: Allow open/close door.

Bit7: Detect the leveling switch abnormality

0: Do not detect the leveling switch abnormality.

1: Detect the leveling switch abnormality.

Bit8: Detect the door motor CD arrival at inspection running

0: Do not detect close door arrival. At inspection running, judge the elevator door closed arrival only in according with locked-door signal.

1: Detect close door arrival.

Bit9: Forced Dec. stop in inspection run end station

0: No parking.

1: Parking.

Bit10: Open door at non-leveling area in inspection running

0: Do not allow to open the door.

1: Allow to open the door.

Bit11: Output loop detection mode

0: Only works in slow mode.

1: Express, slow running are detected. It must be used with F27.28 Bit15.

Bit12: Curve selection in inspection run

0: Linear Acc. / Dec.

1: S curve Acc. / Dec.

Bit13: Prompt for inspection buzzer

0: No prompt.

1: Intermittent beep reminder.

Bit14: Check the zero speed running brake

0: Do not open the brake.

1: Open the brake.

Bit15: Buzzer operation with Fire alarm signal in inspection mode

0: Action.

1: Do not move.

F26.13	Forced close door	0, 1 [0]

0: Not open.

1: Open.

F26.14	Door lock short detection function	0 - 65535 [1]

Bit0: Door lock jump-out test function

0: Not open.

1: Open.

Bit1: Door lock jump-out test mode

0: Test total door lock circuits together.

- All lock circuits in the door lock closed state, if a door motor OD arrival signal is received, it will alarm E0053 fault (lock-door short-circuit fault).

1: Test each door lock circuit independently.

- Any one of lock circuits in the door lock closed state, if a door motor OD arrival signal is received, it will alarm E0053 fault (lock-door short-circuit fault).

Bit2: Auto-reset at door lock jump-out fault

0: No auto-reset.

1: Auto-reset.

Bit3: Sealed door output to test door lock shorted

0: Do not start.

1: Start.

Bit4: X28 high voltage door lock short input

0: Invalid.

1: Valid.

Bit5: Detection of car door switch sticking or door closing signal adhesion after 3s of door opening

0: Netection.

1: Not detected.

Bit6: Car door switch adhesion detection conditions

0: Detected when the lock is open.

1: Detection when door lock is connected and disconnected.

Bit7: X28 high voltage signal as door lock 3 detection signal

0: Invalid.

1: Valid.

Remark: After F26.14 Bit4 is set to 1, Bit7 function is invalid.

Bit8: Door lock shorted E53 fault UCMP protection

0: No protection.

1: Protection.

Bit9 - Bit15: Reserved

F26.15	Battery-driven run parameter setting	0 - 65535 [1]

Bit0: Battery-driven self-rescue timeout protection

0: Protection.

1: No protection.

- t battery-driven self-rescue, if the car is in balance load or the rescue driving power's capacity is not adequate, it will cause long emergency rescue time and even dangers occur.
- After the Bit0 is set as zero, it will enable to stop rescuing when auto-running car rescue time is over 100s, and rescue driving time is over 50s.

Bit1: Syn. motor battery-driven auto-running

0: Not open.

1: Open.

Bit2: Battery-driven direction judgment

0: Auto judge. The controller will automatically open the brake and detect the elevator light-load to auto judge the elevator running direction.

1: Judge in accordance to weighing signal.

Bit3: Fixed up run of battery-driven direction

0: This bit should not decide the direction.

1: The direction is fixed up run.

Bit4: Fixed down run of battery-driven direction

0: This bit should not decide the direction.

1: The direction is fixed down run.

Bit5: Open the function of auto-running car change into driving

0: Not open.

1: Open.

Bit6: Mode of auto-running car change into driving

0: Time setting, for 50s not yet reached the leveling change into driving.

1: Speed setting, after auto-running car for 10s and the speed is smaller than F26.28.

Bit7: Battery-driven beep prompting way

0: Continuous.

1: Intermittent.

Bit8: auto-compensation is started in battery-driven mode

0: Not start.

1: Start.

Bit9: Door motor action after battery-driven mode

0: Keep open.

1: Closeing after open.

Bit10: Brake action times in direction atuo-judgement after battery-driven mode

0: Act for two times.

1: Act for one times

Bit11: Protection time selection

In Emergency operation timeout

0: 60s protection.

1: Automatic calculation based on running speed and floor distance.

Bit12: Inspection mode judgment in emergency operation

0: Judgment based on external terminal.

1: Judgment based on input voltage and external terminal.

Bit13: Emergency run command selection

0: UPC output contactor feedback.

1: External ARD provided.

Bit14: Dec. parking mode

0: Dec.elerated parking at the up and lowleveling.

1: Dec.elerate to stop when leveling.

Bit15: Reserved

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F26.16	Added function selection	0 - 65535 [1]

Bit0: Stop without run command and auto open door

0: Do not auto open door.

1: Auto open door.

Bit1: Parallel waiting elevator function selection

0: Dispersion waiting elevator.

1: Centralization waiting elevator.

Bit2: Battery driven reset auto return to base station

0: Auto return to base station.

1: Do not return to base station.

Bit3: Cleared conditions of firefighting back to base station mode

0: Power off or firefighting switch is invalid

1: Fireman input valid and then clear.

Bit4: Non-service floor is allowed to be service at fireman operating elevator

0: Not allow to be service.

1: Allow to be service.

Bit5: Non-service floor is allowed to open the door at fireman operating door machine

0: Not allow to open door.

1: Allow to open door.

Bit6: OD selection at firefighting back to base station power up

0: Open door.

1: No open door.

Bit7: E0041 clear the car call

Bit8: E0051 clear the car call

0: Fault clear the car call.

1: Fault do not clear the car call.

Bit9: Open the manually pull door function

0: Not open.

1: Open.

Bit10: Selections of up/down limit switch

0: Use the actual up/down limit switch.

1: Use the synthesis of leveling floor and end station switch.

Bit11: Automatically back to leveling

0: Automatically back to leveling due to meeting the running condition.

1: Back to leveling for the setting run command.

Bit12: Car energy-saving selections at open door waiting for elevator

0: Not energy-saving.

1: Energy-saving.

Bit13: Floor registration number at firemen mode

0: Only register one car call.

1: Can register some car call.

Bit14: Detect the timeout at automatic back to leveling

0: Detect.

1: Do not detect.

Bit15: Reverse cancelling

0: Cancelling car call in normally reverse.

1: Cancelling car call in not reverse.

F26.17	Contactor contact adhension failure auto reset	0, 1 [0]

Detect the run and the brake contactors' feedback contacts, alarm E0056 fault (run contactor feedback abnormal) and E0057 fault (brake contactor feedback abnormal) if the contacts are deviant, and they can't reset automatically.

If E0056 and E0057 faults occur, this function enables to reset automatically no more than three times as long as these faults disappear.

0: Not open.

1: Open.

F26.18	Forced Dec. switch adhesion detection	0, 1 [1]

This function enables to monitor the forced Dec. switch all the time when the elevator is running. If adhesion is detected, it's forced to decelerate.

0: Not open.

1: Open.

F26.19	Syn. motor star-delta contactor parameter setting	0 - 65535 [0]

The Syn. motor star-delta contactor can assure that there won't be fast speed slide running even when the brake doesn't work.

- F26.19 is only valid for the Syn. motor.
- Based on the actual wiring diagram, set Syn. star-delta contactor as NO/ NC type, control signal and feedback contact detection signal. Details refer to the MCB terminal function of group F12.

Bit0: Synchronous star-delta contactor control selection

0: No control the output.

1: Control the output.

Bit1: Synchronous star-delta contactor NO or NC setting

0: NC. Generally use the normally close.

1: NO.

Bit2: HDRU failure level

0: Warning, continue to run.

1: Stop and stop running.

Bit3: STO function is enabled

0: STO is off.

1: STO is on. When set to 1, the elevator control system needs to replace the contactor with a safety relay scheme. The contact feedback signal is not needed inside the control system. The STO feedback terminal needs to be connected to the corresponding terminal of the MCB board SK7.

Bit4: Run timeout fault handling mode

0: Stops after reporting a fault.

1: It can still run after the fault is reported. After reporting the running timeout fault, after the 3S shutdown, the fault is automatically reset, and then the Max. timeout fault is allowed to be 2 times. When more than 3 times of the running timeout, the elevator stops running.

Bit5: External use lock ladder signal use

0: Lock the ladder.

1: Close the signal.

Bit6: Outside the fire signal

0: Fire signal.

1: Open the door signal.

Bit7: Keypad undervoltage and E41 display

0: Priority is displayed for undervoltage.

1: E41 is displayed first.

Bit8: Machine room 12V power supply display

0: Priority display speed and running direction.

1: Priority display of floor fault information.

Bit9: Emergency mode Dec. parking mode

0: Slow down and stop.

1: Lower the brake to stop.

Bit10: Flat layer signal optimization processing

0: Normally processed.

1: Software optimization processing.

Remarks: For the uneven layer, non-stop, and slow Dec. caused by flashing of the leveling signal on the site, it can be changed to 1 to overcome the leveling interference problem

Bit11: Emergency mode Dec. stop to determine bus voltage

0: Do not judge the bus voltage.

1: Determine the bus voltage.

Remark: After this bit is set to 1, if the bus voltage is detected to drop to a certain extent during Dec., the brake will be closed in advance.

Bit12: Idle back to the base station to open the door

0: Open the door.

1: Do not open the door.

Bit13: No registration floor removal direction signal selection in front

0: The door closing process removes.

1: The door opening process removes.

Bit14: Open door hold time is automatically associated with the machine temperature

0: Not associated.

1: Association.

Bit15: Automatic running maintenance command processing

0: Switch after parking directly.

1: Switch after decelerating to stop.

F26.20	Chime output selection at night arrival	0, 1 [1]

0: Output.

1: No output. The station clock signal is not output from 11:00 to 7:00 the next day.

F26.21	Open-through door control	0, 1 [0]

0: Not open.

1: Open.

F26.22	Added function selection 2	0 - 65535 [0]

Bit0: Car call to open door at present floor

0: Not open door.

1: Open door.

Bit1: Buzzer reminder of car call floor registration

0: Reminder.

1: Not reminder.

Bit2: R-cam output mode

0: Keep output with car closing command.

1: Interval output with car closing command.

Bit3: Start service floor in group control

0: Invalid.

1: Floor set service floor via communication in group control.

Note: When the Bit3 is enabled, the meaning of F21.07 - F21.09 becomes the group control service floor. These three parameters are automatically set by the GCB board.

Bit4: External initial mode of fire-fighting return to base station

0: Level mode.

1: Pulse trigger mode.

Bit5: Not trapped elevator optional card function opened

0: Not open.

1: Open.

Bit6: No trapped door lock sequency

0: Door lock from 1st floor to top floor.

1: The door locks are arranged from the top floor to the first floor.

Bit7: Door closing arrival and no door lock connection

0: Keep closing.

1: Turn off the door after repeated 3 times.

- only works when there is no door open protection.

Bit8: Control mode in Front and rear door opening delay

0: Simultaneous control.

1: Separate control.

Bit9: Keypad failure turns to fault mode display

0: Go to fault mode display.

1: Keep the original menu.

Bit10: Start service floor for isolated elevator

0: Invalid.

1: Valid.

Note: When this function is enabled, the meaning of F21.12 - F27.14 becomes the stand-alone service floor.

Bit11: Buzzer reminder in manual door lock disconnection

0: No reminder.

1: Reminder.

Bit12: Semi-auto car door closing conditions

0: Normal shutdown.

1: Closed after hall door lock connected.

- Set to 1: Used in the case where the car door is an automatic door and the hall door is a hand-drawn door. When the hall door is opened, the car door remains open. When the hall door is closed, the car door begins to close.
- The V2.09 version removes this feature, which is ported to F12.38 Bit11.

Bit13: UCMP test active break door contactor selection

0: Software to automatically break the door contactor.

1: Break the door contactor by hardware.

Bit14: The system floor is associated with the door motor service floor

0: Association. Door machine service floor participation system service floor.

1: Not associated. Door machine service floor does not participate in system service floor.

Bit15: Car lights off in fire-fight back to the base station

0: Normal processing.

1: Off during the process of returning base station.

F26.23	Added function selection 3	0 - 65535 [1]

Bit0: Door open function selection in door open delay button

0: Door open delay button not work in door closing.

1: Press door open delay button to open door in door closing.

Bit1, Bit2: Reserved

Bit3: Detect ground short before stating

0: Enable.

1: Disable.

Bit4: Elevator positon judgement is added in door open condition

0: Not related with positon.

1: Related with positon.

Bit5: Reserved

Bit6: Door open/closing fault can be reset by door closing button

0: Not reset.

1: Reset.

Bit7: Hanling of leveling switch fault

0: Stop in Dec.

1: Stop with fault shows.

Bit8: Output condition of door open command

0: Door open command is given after controller output voltage is off.

1: Controller gives door open command after detecting output relay disconnection when output voltage is off.

Bit9: The group control board opens the single ladder lock ladder and enters the driver mode function

0: Opening is not allowed.

1: Allowed to open.

Note: When set to 1 instead, can use the group control PC software to lock the elevator in the group control and operate the single elevator through the host computer to enter the driver mode.

Bit10: Full load does not respond to the door opening signal outside the hall

0: Response.

1: Not responding.

Bit11: Front door service layer is related to system time

0: Not relevant.

1: Related to the F21.20 and F21.21.

- F21.20 < F21.21, if the current time is between F21.20 and F21.21, the front door motor is in the service state, otherwise it becomes the non-service state.
- F21.20 > F21.21, if the current time is outside F21.20 and F21.21, the front door motor is in the service state, otherwise it becomes the non-service state.

Bit12: Rear door service layer is related to system time

0: Not relevant.

1: Related to the F21.23 and F21.24.

- F21.23 < F21.24, if the current time is between F21.23 and F21.24, the front door motor is in the service state, otherwise it becomes the non-service state.
- F21.23 > F21.24, if the current time is outside F21.23 and F21.24, the front door motor is in the service state, otherwise it becomes the non-service state.

Bit13: The keypad displays the fault code

0: Display.

1: Do not display the fault code. The hoistway self-learning fault is normally displayed.

Bit15&Bit14: Distance control margin with crawler segment

00: The margin is 5CM.

01: The margin is 10CM.

10: The margin is 20CM.

11: The margin is 30CM.

F26.24	Position deviation too large and return to run	0, 1 [1]
F26.25	Position deviation too large and base setting	180 - 1200 [400mm]

F26.24 defines whether the base station processing is performed when the elevator position deviation is too large.

F26.25 is used as a reference value for detecting deviation excessively.Position deviation too large and base setting.

0: Do not return to the base station.

1: Return to the base station.

F26.26	Functions of optional card enable	0 - 65535 [0]

Bit0: HDRU is connected

0: Not connected.

1: Connected.

Bit1: True color LCD configuration in car

0: No true color LCD configuration.

1: True color LCD configuration.

Bit2: True color LCD display mode

0: Vertical display.

1: Horizontal display.

Bit5&Bit4&Bit3: Hall call type

000: Standard.

001: MNC.

010: Reserved.

011: General External Agreement.

Bit6: Yard Monitoring CIC converter card open

0: Not open.

1: Open.

Bit7 - Bit15: Reserved

F26.27	Firefighting second base station	0 - F19.00 [0]
F26.28	Lowest speed judgment at auto-running car	0.005 - 0.630 [0.010m/s]
F26.29	Emergency return leveling and stop delay	0.000 - 3.000 [0.100s]

When the emergency leveling operation is defined, after receiving the upper and lower leveling signals, after F26.29 time, decelerate to stop.

- Used to adjust the leveling accuracy of the leveling layer.

F26.30	Return leveling and stop delay	0.000 - 3.000 [0.100s]

When the automatic leveling operation and the door opening and re-leveling operation are defined, after receiving the upper and lower leveling signals, after F26.30 time, the vehicle will decelerate to stop.

- Used to adjust the leveling accuracy of the leveling layer, which is automatically updated after the well is self-learned.
- The user generally does not need to change. When the leveling accuracy is not good or the number of times of returning to a level in a door area exceeds 3 times, F26.30 can be adjusted for leveling.

F26.31	Check the hall call address	0, 1 [0]

0: Normal display of hall call.

1: Change data of hall call floor display into display hall call address.

F26.32	Hall call display data automatically arranged	0 - 65535 [0]

Bit0: Hall call display automatically arranged

0: Invalid.

1: Hall call display data automatically arranged. A parameter of F24 group is set to display 1, and the following parameters are automatically incremented.

Bit1: Any floor hall call locked-elevator and firefighting

0: Not open.

1: Open.

Bit2: E52 fault clear hall call registration information

0: Clear.

1: Not clear.

Bit3: Scroll speed selections of hall call

0: Associated with the elevator speed.

1: Not associate with the elevator spee.

Bit4: Arrival chime output selection

0: Hall call, car top to the station normal output.

1: Only base stations have output.

Bit5: Hall call into the display self-test status

0: Hall call normal display.

1: Hall call display self-test mode.

Bit6: Small keypad standby display

0: Display direction, floor.

1: No machine room, display speed, leveling floor.

Bit7 - Bit9: Reserved

Bit10: Single hall call enable

0: Disenable.

1: Enable.

Bit11 - Bit15: Reserved

F26.33	Time of timing on of elevator	00:00 - 23:59 [00:00]
F26.34	Time of timing off of elevator	00:00 - 23:59 [00:00]

1. F26.33, the first two digits of F26.34 are hours, expressed in 24 hours. The last two digits are minutes.
   - Set F26.33 to 07:00 and F26.34 to 23:00, then the elevator service time is 07:00 - 23:00.
   - Set F26.33 to 07:00 and F26.34 to 01:00, then the elevator service time is 07:00 on the same day - 01:00 on the next day.
2. Set the automatic opening/closing time to 00:00 to cancel the function
3. If there is already a lock ladder signal on the outside, the timer switch ladder function is invalid.
4. If you need to use the elevator during the elevator non-service period, the operation is as follows:
   - The lock switch is turned from open to closed. After waiting for 1 s, the lock switch is turned to open, the system enters the forced running state, and the elevator can operate normally.
   - After use, the lock switch is turned from open to closed. After waiting for 1 s, the lock switch is turned to open, and the forced running state is exited, and the lock ladder state is re-entered.

F26.35	Hall call parameter setting	0 - 65535 [512]

The display mode of the hall call board is defined and used in conjunction with F26.36.

Bit0: Digital arrow display mode

0: Scroll.

1: Fixed.

Bit1: Arrow display format

0: Big arrow.

1: Small arrow.

Bit2: Direction key input type

Bit3: Fire signal input type

Bit4: Lock elevator signal input type

0: NO.

1: NC.

Bit5: Floor switching display

0: Dynamic scrolling.

1: Directly over-switch.

Bit6: Single number center display

0: Centered display.

1: Unilateral display.

Bit7: Energy saving display options

0: Allow energy saving display.

1: Disable normal display.

Bit9&Bit8: LCD display brightness adjustment

00: Low brightness.

01: Medium brightness.

10: high brightness.

11: Highest brightness.

Bit10: Hall call board display fault code

0: Not display.

1: Display.

Bit11: Manufacturer agreement compatible

0: Mode 0.

1: Mode 1.

- Used to set the elevator call arrow display mode in EXXT two external recruitment protocols.

Bit12 - Bit15: Reserved

F26.36	Hall call parameter setting confirm	0, 1 [0]

0: No action.

1: Hall call parameter setting confirming.

Note: After modifying the F26.35 parameters, you need to set F26.36 to 1, and transfer the hall call board settings to each building floor of the hall and the call board by communication.
When only F26.35 Bit10 is modified, it is not necessary to set F26.36.

F26.37	Hall Calling HCB-H indicator 1 meaning	0 - 5 [1]
F26.38	Hall Calling HCB-H indicator 2 meaning	0 - 5 [2]

F26.39	Car Calling HCB-H indicator 1 meaning	0 - 5 [4]
F26.40	Car Calling HCB-H indicator 2 meaning	0 - 5 [5]

F26.37 - F23.40 defines the meaning of indicator 1 and indicator 2 of NL3000-HCB-H, NL3000-HCB-F.

- Indicator 1 and Indicator 2 are located in section 4.5.1 and 4.5.2.
- Users can flexibly choose according to the actual configuration of the elevator.

0: No function.

1: Full load indication.

2: Maintenance instructions.

3: Disable instruction.

4: Overload indication.

5: Fault indication.

7.2.28 F27: Elevator Adjustment Enhanced Function

F27.00	Leveling sensor delay	0 - 50 [4ms]
F27.01	Leveling fine-tuning mode	0, 1 [0]

0: F27.02 - F27.25 each parameter can adjust every two floors.

- F27.02 debugs the level 1 and 2 floor, respectively. F27.03 debugs the 3rd and 4th floors.

1: F27.02 - F27.25 each parameter can adjust every one floor.

- F27.02 debugs the 1st floor up and down leveling, F27.03 debugs 2nd floor up and down level.

F27.02	Leveling adjustment record 1-2 Up/down leveling adjustment for the 1st floor	00000 - 60060 [30030]
F27.03	Leveling adjustment record 3-4 Up/down leveling adjustment for the 2nd floor	00000 - 60060 [30030]
……		
F27.24	Leveling adjustment record 45-46 Up/down leveling adjustment for the 23rd floor	00000 - 60060 [30030]
F27.25	Leveling adjustment record 47-48 Up/down leveling adjustment for the 24th floor	00000 - 60060 [30030]

F27.01 = 0, F27.02 - F27.25 records the value of the level adjustment of 2 floors for each parameter.

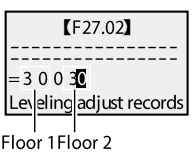
F27.02 records the leveling adjustment 1 - 2. F27.03 records the leveling adjustment 3 - 4.

- Recording of leveling adjustments for 48 floors.

Adjust the view of the record:

Take the parameter F27.02 as an example, see the figure on the right.

- The leftmost and rightmost two digits are the adjustment base for Floor 1 and Floor 2, respectively.
- Greater than 30 for floor up adjustment, less than 30 for floor down adjustment, default 30 for no adjustment.
- The Max. adjustment range is 0 - 60mm.



F27.01 = 1, each F27.02 - F27.25 records the value of the up-down and down-level adjustment of 1 floor.

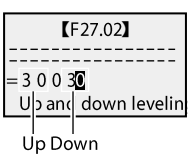
F27.02 records the 1st floor up and down leveling adjustment.

- Up to 24 floors can be recorded, down level adjustment can record up and down leveling for 24 floors

Adjust the view of the record:

Take the parameter F27.02 as an example, see the figure on the right.

- The leftmost and rightmost two digits are the upside of floor 1, and the downside adjustment base.
- Greater than 30 for floor up adjustment, less than 30 for floor down adjustment, default 30 for no adjustment.
- The Max. adjustment range is 0 - 60mm.



F27.26	Program control selection 1	0 - 65535 [28673]

Bit0: At car/hall call arrival it is flashing to prompt

0: Not open.

1: Open.

Bit1: Double-click the OD delay button to cancel the function

0: Not work.

1: Work.

Bit2: Priority function of car call

0: Invalid.

1: If there is car call , it will not response hall call.

Bit3: At locked-elevator close the hall call display

0: At locked-elevator close the hall call display.

1: The hall call display normally.

Bit4: Small keypad displays fault code

0: Displays fault code.

1: Not displays fault code.

Bit5: Small keypad allows parameter auto-tuning

Bit6: Small keypad allows modifying the encoder direction

0: Not allow.

1: Allow.

Bit7: CD button closes thedoor without OD arrival

0: Not close.

1: Close.

Bit8: Door state at locked-elevator

0: Close door and lock elevator.

1: Open door and lock elevator.

Bit9: Fireman run at low speed to open/close the door

0: Not open/close the door.

1: Open/close the door.

Bit10: Firefighting back to base station and buzzer acts

Bit11: Buzzer acts for excessive position deviation

0: Act.

1: Not act.

Bit12: E38, E39 fault will reset

Bit13: E45 fault will reset

Bit14: E55 fault will reset

0: Not automatically reset.

1: Up to three times resets.

Bit15: Ultra short floor function

0: Invalid.

1: Valid.

F27.27	Program control selection 2	0 - 65535 [0]

Bit0: Safety circuit fault priority

0: The level is normal.

1: The level is high. If there are other faults in the system, after the safety loop is disconnected, the system automatically resets the original fault and the current fault code is updated to the safety loop disconnect fault.

Bit1: Door lock failure detection

0: Normal detection.

1: Quick detection.

Bit2: E43, E44 fault auto reset

0: Not reset automatically.

1: Automatic reset.

Bit3: Single door inner slave instructions is used fo disability

0: Invalid.

1: Valid.

Bit4: Use of the folding instructions

0: Disability.

1: Back door.

Bit5: Bend the instructions

0: Invalid. CN2 for front door or ordinary call, CN3 for rear door or disabled.

1: Valid. CN2, CN3 directive 1-16 for the front door or ordinary call. 17-32 for the rear door or disabled call.

Bit6: Disabled hall call board disability function

0: Not open.

1: Open.

Bit7: ordinary hall call disabled function

0: Not open.

1: Open. The lock ladder signal corresponds to the disabled obstacle call signal, and the fire signal corresponds to the disabled downlink call signal. The light up and down obstacle button lights can be controlled together with the common up and down lighting signals.

Bit8: In stop, slipping protection function opened

0: Not open.

1: Open.

Bit11/Bit10/Bit9: Car call display protocol

000: Standard.

001: MNC.

010: Reserved.

011: IKS.

100: General External Agreement.

101: EXXT.

Other: Reserved.

Bit12: E38\E39 handling of returning base station in fault

0: Not returning to base station.

1: Return to base station

Bit13: Car movement monitoring output is automatically reset

0: Auto reset (auto reset in door lock connection).

1: Manual reset (Report E0064 fault).

Bit14: Power down recovery in firefighter's running

0: Normal processing.

1: Direct firefighter run.

Bit15: Allow small keypad to modify the elevator running direction

0: Not allowed.

1: Allow.

F27.28	Program control selection 3	0 - 65535 [0]

Bit0: Light curtain judgement for OD arrival

0: Light curtain work.

1: Light curtain not work.

Bit1: Exit of returning to base station in fireman

0: Exit.

1: Can not exit.

Bit2: floor display in hall in firefighting

0: Floor display.

1: No floor display.

Bit3: Auto-reset of fault

0: Fault can not be reset.

1: Auto-reset 1time per hour.

Bit4: Reverse logic of MCB light

0: No reversal.

1: Reverse logic.

Bit5: Stop in Dec. by light curtain in manual door

0: No function.

1: Stop in Dec.

Bit6: Brake is protected by door lock

0: Brake protection is excuted when door lock is disonnected.

1: Brake protection is excuted both in connection and disconnection of door lock.

Bit7: Back to leveling direction in terminal station

0: Back to leveling nearby.

1: Back to leveling far from terminal station.

Bit8: Keeping of parallel elevator when idle

0: Invalid.

1: Valid.

Bit9: Judge CD arrival during back to leveling

0: Judged.

1: Not judged.

Bit10: Auto-closing door without OD arrival signal

0: Not auto-closing door.

1: Auto-closing door without OD arrival signal after time set by F22.03.

Bit11: Forced Dec. switch type

0: Ordinary.

1: Touchable.

Bit12: Brake anomaly detection adhesion

0: No detection.

1: Detection.

Bit13: Door lock condition for judgement of car slipping

0: Door lock connection to detect car slipping.

1: Cat slipping is detected by F27.28 Bit6.

Bit14: Detection of output circuit is started

0: Not detecting.

1: Detecting.

Bit15: Detecting car slip in stop

0: Not detecting.

1: Detecting. When the parking is detected, the elevator slips more than 5cm, the control system reported E64 failure.

F27.29	Program control selection 4	0 - 65535 [0]

Bit1&Bit0: Elevator selection in same floor in parallel

00: Service of the minimum running times.

01: Main elevator service.

10: Slave elevator service.

11: Slave elevator service.

Bit2: Mode of returning base station in all elevators waiting

0: Returning to base stations of each other.

1: Returning to the nearest station.

Bit4&Bit3: Door state when emergency stop at door area

00: Keep OD.

01: Keep CD.

10, 11: Keep original door state.

Bit5: OD/CD arrival signals type

0: Electrical level.

1: Keep along by touchable band.

Bit6: Light curtain action of front and rear door

0: Seperated.

1: Act at the same time.

Bit7: Door motot action after OD/CD fault for 30s

0: Keep OD.

1: Not output OD/CD signal.

Bit8: Fault reset selection

0: Fault can be rest when power down.

1: Only keypad can be used to reset fault.

Bit9: Buzzer remind when continuous actions of light curtain board are over 15s

0: No eminding.

1: Interval buzzer reminders.

Bit10: Overtime is detected during shaft self-learning

0: Over-time of detection.

1: Not detecting the over-time.

Bit11: Detecting time extended by 15s when back releving time is over

0: Not extending.

1: extending 15s.

Bit12: Over-leading is detected in door lock connection

0: Detection.

1: Not detecting.

Bit13: CD action selection in VIP mode

0: Door closing in continiouse pressing of closing buttton.

1: Door closing in pressing button for only one time.

Bit14: Enable assist detection in over-loading

0: Disable.

1: Enable.

Bit15: Take up/down elevator calling signal of disabled hall call as present floor OD/CD signal

0: Invalid.

1: Valid. After enabling this function: up disabled calling signal is as OD signal. down disabled calling signal is as CD signal.

F27.30	Last fault subcode	0 - 9999 [0]
F27.31	Latest setting speed	0.000 - 4.000 [0.000m/s]
F27.32	Latest elevator location	0.00 - 299.99 [0.00m]
F27.33	Last X1 - X16 terminal status	0 - 65535 [0]
F27.34	Last X17 - X28 terminal status	0 - 4095 [0]
F27.35	Last output frequency	0.00 - 100.00 [0.00Hz]

These fault record information is a supplement to the fault information recorded by the group F19.

When F27.30 is faulty, the specific cause of the fault is displayed.

F27.33 Bit15 - Bit0 represents X16 - X1 in turn. F27.34 Bit10 - Bit0 represents X27 - X17 in turn.

F27.36	Specify the fault setting	0 - 99 [0]
F27.37	Specify the fault	0 - 99 [0]
F27.38	Specify the fault subcode	0 - 9999 [0]
F27.39	Specify the month and day of fault	0 - 1231 [0]
F27.40	Specify the time of fault	00:00 - 23:59 [00:00]
F27.41	Specify the running speed of fault	0.000 - 4.000 [0.000m/s]
F27.42	Specify the DC bus voltage of fault	0 - 999 [0V]
F27.43	Specify the output current of fault	0.0 - 999.9 [0.0A]
F27.44	Specify the setting speed of fault	0.000 - 4.000 [0.000m/s]
F27.45	Specify the elevator location of fault	0.00 - 299.99 [0.00m]
F27.46	Specify the X1 - X16 terminal state of fault	0 - 65535 [0]
F27.47	Specify the X17 - X27 terminal state of fault	0 - 4095 [0]
F27.48	Specify the output frequency of fault	0.00 - 100.00 [0.00Hz]

F27.36 is a specific fault set. When the fault occurs is the same as F27.36, the related information of the fault will be recorded to F27.37 - F27.48, the record will not be caused by other faults next time. Information is cleared.

F27.49	1st fault subcode	0 - 9999 [0]
F27.50	2nd fault subcode	0 - 9999 [0]
F27.51	3rd fault subcode	0 - 9999 [0]
F27.52	4th fault subcode	0 - 9999 [0]
F27.53	5th fault subcode	0 - 9999 [0]
F27.54	6th fault subcode	0 - 9999 [0]
F27.55	7th fault subcode	0 - 9999 [0]
F27.56	8th fault subcode	0 - 9999 [0]
F27.57	9th fault subcode	0 - 9999 [0]
F27.58	10th fault subcode	0 - 9999 [0]

F27.49 - F27.58 is a supplementary explanation for the specific reasons for the last 10 faults in the group F19, which is convenient for troubleshooting the cause of the fault.

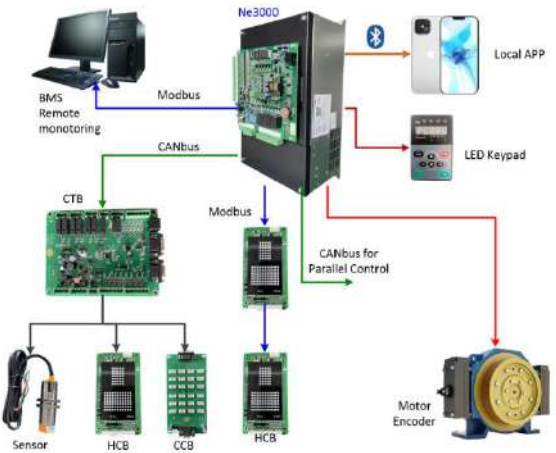
F27.59	Factory debugging parameters	

7.3 Group Y Manufacturer Function

The group Y is the manufacturer parameters group for debugging NL3000 at the factory before delivery, which need no concerned about at using.

Chapter 8 System Typical Application and Adjustment

8.1 Electrical System Structure



8.2 Adjustment Process

As the periphery circuit and machine installed are finished fully, you can adjust the NL3000 series elevator integrated controller in accordance with the process of the following table.

1.	Wiring Check, See section 8.2.1, page 155
2.	Parameter Setting, See section8.2.2, page 156
3.	Motor Parameter Auto-tuning, See section 8.2.3, page 158
4.	Inspection Operation, See section 8.2.4, page 161
5.	Shaft Self-learning, See section 0, page 162
6.	Check before High Speed, See section 8.2.6, page 163
7.	High Speed Running, See section 8.2.7, page 165
8.	Function Test, See section 8.2.8, page 167
9.	Adjustment for Comfortable Feeling, see section 8.2.9, page169
10.	UCMP Function, see section 8.2.10, page 176
11.	Brake Force Detection Function, see section 8.2.11, page 177

8.2.1 Wiring Check

After the control system wiring is finished, it need check the wiring:

1.	Check the electrical and mechanical wiring to ensure the safety.
2.	Check each connection whether is right in accordance with the manual and the wiring description. At least two staffs are required in debugging. And cut off the power immediately if abnormal situation occurs.
3.	Check if the parts' types are matched. The safety circuit is passed through and the signal is normal. The door lock circuit is passed through and work reliably.
4.	Shaft is smooth and no one is in the car, and it possesses the conditions suitable for the elevator safety running.
5.	Really check the input power and the motor wirings whether are correct to avoid misusing power transmission and cause NL3000 damage.
6.	Check the control panel, motor, car ground cable and hall ground cable whether is safely grounded to ensure the personal safety. *Note: The control panel and the motor should be confidential single point grounded.*
7.	Check the short-circuiting. If there is short-circuiting, please do not power up until exclude the short-circuiting. • The input power supply interphase to the ground. • The motor interphase to the ground. • 220V interphase to the ground. • The switch power supply 24V to the ground. • The communication wire to the ground. • The encoder wire to the ground.
8.	Make sure the following items are reliably grounded. • The control panel is grounded. • The motor is grounded. • The car is grounded. • The door motor is grounded. • The pipeline is grounded. • The shielded encoder and motor end are grounded. *Note: The encoder's shielded cable requires one terminal of NL3000 to connect to the ground reliably.*
9.	Check the wirings of communication wire, encoder wire and power supply wire. • The well's communication wire is twisted pair and twisted distance is < 35mm. • The car's communication wire is twisted pair and twisted distance is < 35mm. • The parallel group control communication wire is twisted pair and twisted distance is < 35mm (only in parallel and group control elevator). • The encoder wire and the power supply wire should be separated from the alignment. • The communication wire and the power supply wire should be separated from the alignment. • The parallel group control communication wire and the power supply wire should be separated from the alignment (only in parallel and group control elevator).

8.2.2 Parameter Setting

System Power and Check

Remove the brake control wire before power up.

1. Check the MCB +24V power supply input, and SK3 terminal of +24V and COM should be 24V.

2. Observe the corresponding LED lights of MCB X25 - X27 to confirm that the high voltage safety circuit and the high voltage door lock circuit are in normal status. If the site still has low voltage safety circuit signal and low voltage lock signal, please check the corresponding input terminals of the MCB LED lights.

3. Observe the MCB Y1 - Y6 LED lights to confirm the control brake relay without outputting, and connect to the brake control wire until power is cut down.

Set NL3000 Parameters (Must Follow These Steps)

Restore the factory parameter: F01.02 is set as 1 (restore to factory settings), press **ENT** key, and then the controller parameters restore to factory setting value.

Set the other parameters refer to the following table. And check the corresponding state of MCB and CTB I/O terminal setting function by group D.

Ref. Code	Function	Recommended Value	Remark
F00.00	Motor type	Based on the actual setting	
F00.01	Control mode	2 (VC control)	
F00.02	Elevator Max. running speed	Based on the actual setting	
F00.03	Elevator rated speed	Based on the actual setting	
F00.04	Elevator rated load	Based on the actual setting	
F00.05	Controller Max. output frequency	Based on the motor setting	Generally set as the motor rated frequency
Group F03	Acc. and Dec. curve parameter	Set in needing	
Group F04	Speed parameter	Set in needing	
F07.00	Asyn. motor rated power	Based on the actual setting	Selected as Asyn. motor, need to set Asyn. Motor name plate parameter in group F07
F07.01	Asyn. motor rated voltage	Based on the actual setting	
F07.02	Asyn. motor rated current	Based on the actual setting	
F07.03	Asyn. motor rated frequency	Based on the actual setting	
F07.04	Asyn. motor rated Rpm	Based on the actual setting	
F07.05	Asyn. motor power factor	Based on the actual setting	

Ref. Code	Function	Recommended value	Remark
F10.01	Syn. motor rated power	Based on the actual setting	Selected as Syn. motor, need to setsyn. Motor name plate parameter in group F10 *Note:* *If F10.00, F10.06-F10.09 is not accurate.* *Parameters, please set to 0, otherwise it may not run properly!*
F10.02	Syn. motor rated voltage	Based on the actual setting	
F10.03	Syn. motor rated current	Based on the actual setting	
F10.04	Syn. motor rated frequency	Based on the actual setting	
F10.05	Syn. motor rated Rpm	Based on the actual setting	
F10.09	Syn. motor counter emf	Based on the actual setting	
F11.00	Encoder card selection	Based on the actual setting	Setting by encoder
F11.01	Encoder card pulses/rotation	Based on the actual setting	
F11.02	Encoder card rotation direction setting	Based on the actual setting	
Group F12	MCB input terminal setting	Set according to the drawings • Select the input high or low active by jumper CN2; • Select NO or close input by parameter setting. • Ensure the input state through observing the corresponding LED lights of MCB input terminals. **X25 - X27 are high voltage safety and door lock input, for the safety, please ensure the safety circuit and the door lock circuit are correct.**	
	MCB relay output terminal setting	Set according to the drawings • Ensure the relay output state by observing the corresponding LED lights of relay output terminals.	
Group F13	CTB input terminal setting	Set according to the drawings • Ensure the input state by observing the corresponding LED lights of CTB input terminals.	
	CTB relay output terminal setting	Set according to the drawings • Ensure the relay output state by observing the corresponding LED lights of relay output terminals.	
Group F23	Time parameters	Based on the actual setting • Check the time of F23.03 - F23.08 whether is consistent with the actual. • If not, please start to set again.	

8.2.3 Motor Parameter Auto-tuning

Note:

1. The crane car is needed for the no-load auto-tuning but not for the auto-tuning with load.

2. The motor and the encoder parameters must be set correctly before parameter auto-tuning.

Asyn. Motor (Auto-tuning with Load and No-load Auto-tuning)

Configure the ABZ/UVW Encoder and SINCOS Encoder	
1.	You should set F00.07 as 0 (keypad control).
2.	Setting F07.06 as 1 (auto-tuning with load) or 2 (no-load auto-tuning), then press **RUN** key to do parameter auto-tuning. The motor does not rotate at auto-tuning with load but rotate at no-load auto-tuning.
3.	After finish auto-tuning, set F00.07 as 1 (distance control).
Note	
1.	*When auto-tuning, it can automatically open the run contactor. If at no-load auto-tuning, it need manually open the brake contactor for the safety.*
2.	*At auto-tuning with load, the motor will give howling duration of about 30s.*
3.	*At no-load auto-tuning, if the motor occurs to oscillation and even overcurrent, please press **STOP** key to stop auto-tuning.* ***Take measure:** Properly adjusting the F07.21 (oscillation-suppression mode) and F07.22 (oscillation-suppression coefficient) can remove the motor oscillation.*
4.	*The Asyn. motor parameter auto-tuning does not require the encoder pole angle learning. After finish auto-tuning at inspection operation, if alarm E0030 fault (encoder reverse direction), the encoder AB directions may be connected reversely.* ***Take measure:** Please change the encoder direction (F11.02).*

Syn. Motor (No-load Auto-tuning)

Configure the ABZ/UVW Encoder and SINCOS Encoder	
1.	Set F00.07 = 0 (keypad control).
2.	Set F10.10 = 2 (no-load auto-tuning), and press **RUN** key to do parameter auto-tuning.
3.	**Configure the ABZ/UVW encoder** **Auto-tuning process:** The controller with DC will locate the motor in one direction and begin to drive motor at a slow speed, and then stop running after some time, which represents that the auto-tuning is completed and obtain F10.12 (motor initial angle) and F11.02 (encoder direction setting). **Configure the SINCOS encoder** **Auto-tuning process:** The controller with DC will locate the motor in one direction and begin to drive motor at a slow speed, and then stop running after one circle, which represents that the auto-tuning is completed and obtain F10.14 - F10.17 (encoder parameters), F10.12 (motor initial angle) and F11.02 (encoder direction setting).
Note	
1.	*During step 2 and step 3, it need manually open the brake contactor.*
2.	*If the system has Syn. motor star-delta contactor, please refer to the parameter setting of section 8.3.1 of power failure emergency running program, at auto-tuning the system will automatically control the star-delta contactor, otherwise it will alarm over-current fault due to the output short-circuit.*
3.	*At no-load auto-tuning, it will automatically detect the encoder direction.*
4.	*Encoder wiring need strictly connect in accordance with the wiring diagram of the encoder, otherwise even if the A/B/Z connections are correct, the motor will run abnormally due to the U/V/W or C/D phases connection fault.*
5.	*For the SINCOS encoders, self-tuning three times, the results of the two minus, the difference should be within 5 °, or with 360 ° / traction motor integer multiples within 5 °, the result is considered normal, otherwise it needs to be re-tuned.* ***If:*** *The motor pole pairs are 12, and three times the auto-tuning results are 241.1°, 59.8° and 120.2°, the difference of three times will be less than 5°.* ***For:*** *Calculate 360°/ 12 = 30°, three times result is 241.1°- 59.8° = 181.3° and 30° integer multiple is 180°, and their difference is 1.3° which is less than 5°. equally 120.2°-59.8° = 60.4° and 30° integer multiple is 60°, the difference is 0.4° which is less than 5°.*
6.	*For the ABZ/UVW encoders, F10.12 is electrical angle, and each time the deviation of F10.12 results should be less than 30°, which can be considered as the normal, otherwise need to restart auto-tuning.*
7.	*If the abnormal occur during auto-tuning process, press **STOP** key to stop auto-tuning.*
8.	*After finish the parameter auto-tuning, it need set F00.07 (operation mode) as 1 (distance control).*
9.	*At auto-tuning, the motor just return from standstill to start the process, if alarm E0030 fault (encoder reverse direction) or E0031 fault (encoder disconnection), you can try to reduce the KP and KI of ASR (group F08).*

Syn. Motor (Auto-tuning with Load)

Before do the auto-tuning with load, please refer to the preparation work of section 8.2.4 Inspection Operation, and then do the Syn. Motor auto-tuning with load.

Configure the ABZ/UVW Encoder and SINCOS Encoder	
1.	F00.07 is set as 1 (distance control). F10.10 is set as 1 (static angle auto-tuning).
2.	**Configure the ABZ/UVW encoder** Give the signals to terminal inspection and direction, at auto-tuning, the controller issues a series of pulse voltage, and the motor issues humming. The motor will run at inspection after the humming is over, and stop running after one circle. Obtaining F10.12 (Syn. motor initial angle) presents that the auto-tuning with load is over.
	Configure the SINCOS encoder Give the signals to terminal inspection and direction, at auto-tuning, the controller issues a series of pulse voltage, and the motor issues humming. The motor will run at slow speed after the humming is over, and automatically stop running after one circle. Obtaining F10.14 - F10.17 (encoder parameters) and F10.12 (Syn. motor initial angle) presents that the auto-tuning with load is over.
3.	After the keypad display interface exits parameter auto-tuning interface, the inspection direction command can be removed.
Note	
1.	*If the system has Syn. motor star-delta contactor, please refer to the parameter setting of section 8.3.1of power failure emergency running program, at auto-tuning the system will automatically control the star-delta contactor, otherwise it will alarm over-current fault due to the output short-circuit.*
2.	*The preset direction is inconsistent with the actual running direction.* ***Take measures:*** *Set the reverse value of F00.10 (elevator run direction), and re-start to do auto-tuning.*
3.	*During the auto-tuning process, if over-current or encoder reverse fault is occurred, it may be the encoder reverse direction.* ***Take measures:*** *Set F11.02 as 1 (the reverse direction), and re-start to do auto-tuning.*
4.	*Since the auto-tuning with load of SINCOS encoder is over, run at inspection again to check whether operating normally. If occur fault or out of control, check whether the CD phases of SINCOS encoder are connected reversely.*
5.	*For sine and cosine encoders, self-tuning three times, the results are subtracted by two, the difference of F10.12 should be within 5 °, or difference from motor pole pairs is within 5 °, the results It is considered normal, otherwise it needs to be re-adjusted.*
6.	*For ABZ/UVW encoders, F10.12 is the electrical angle. Self-tuning for three times, the results will be reduced by two, F10.12 -the difference should be within 30 °, the results will be considered normal, otherwise it needs to be re-adjusted.*
7.	*If auto-tuning is unsuccessful, there will be out of control danger. It is recommended that two people with: one press the inspection button, the other press the emergency stop button, when occur out of control, you can promptly cut off power.*
8.	*If F10.12 (Syn. motor initial angle) is zero, the elevator can not go staircase.*
9.	*Auto-tuning with load is needed to meet that the door lock circuit is closed, and the safety circuit is closed.*
10.	*If the abnormal occur during auto-tuning process, press the emergency stop button to stop auto-tuning.*
11.	*At auto-tuning, the motor just return from standstill to start the process, if alarm E0030 fault (encoder reverse direction) or E0031 fault (encoder disconnection), when changing the encoder direction (F11.02) is invalid, you can try to reduce the KP and KI of ASR (group F08).*

8.2.4 Inspection Operation

Preparation Work before Inspection Operation	
Before inspection operation, **please confirm the following points:**	
1.	The inspection switch of control panel is in the "inspection" position, and the inspection switch of car top is in the "normal" position.
2.	The safety circuit and the door lock circuit of machine room and shaft are normal and effective. *Note: No short-circuit the safety circuit or the door lock circuit.*
3.	The encoder is installed correctly and wiring is normal.
4.	After power up the NL3000 display is normal, and checks the NL3000 parameter settings are correct, the keypad's "status display interface" displays the elevator running state as "inspection", the MCB's INS is lighting.
5.	Motor brake cable is properly connected to the terminals of the control panel.
6.	The wirings of upper and lower terminal Dec. switch and car top inspection priority circuit are normal.
Machine Room Inspection Operation	
1.	To make sure that the direction of motor is correct. If it is not correct, please check the up/down input terminal connection and parameter setting, if the connection is correct, please set the F00.10 as 1 (elevator running direction).
2.	At elevator slow speed up or down running, if NL3000 displays motor's feedback speed instability or excessive preset deviation value, you need to check the wiring between the encoder and encoder interface card: • All connections are correct. If the encoder is a differential signal, the shielded twisted pair cable should be used. otherwise, you can use the general shielded cable. • Wiring is reasonable. The encoder cable and the power line must be strictly separated, which cannot go with a trunking. • Check the shielded wire and the shielded network are reliably grounded.
3.	Check up and down two leveling switches and door zone signal wiring. If the order is wrong, check the external wiring. **The correct is:** • At the elevator slow speed up running, the successively effective signal is: up leveling signal, door zone signal and down leveling signal. • At the elevator slow speed down running, the successively effective signal is: down leveling signal, door zone signal and up leveling signal. The leveling signal installations are refered to section 5.7 (page 51) for the detail.
Note	*1. On many occasions, the slow speed running of the machine room is not inspection run, but the emergency electrical operation. At this time, in the safety circuit, the safety gear switch, the governor switch, the up overspeed protection switch, the up and down terminal limit switch and the buffer reset switch are jump out in the slow speed run, so you must pay particular attention to it.* ***Suggestion:** The emergency electrical running time and distance of the machine room are not too long, but do not run the car to the end terminal position.* *2. When the shaft self-learning is over, and change F00.10 (elevator running direction), the shaft self-learning is needed to be restarted.*

8

Car Top Inspection Operation	
It can not run car top inspection until fully verify the machine room inspection run properly. During the first run, you can set a smaller inspection speed. Actually set F03.06 (inspection Acc. speed), F04.00 (inspection running speed), and F26.12 (treating parameter setting).	
1.	First turn the car top automatic and inspection switch to inspection position, therefore to confirm that up and down buttons in machine room control panel are invalid.
2.	Jog press the up and down buttons of car top to confirm the button direction and the car running direction are consistent.
3.	Operating the elevator up and down on car top for commissioning a back and forth, carefully observe the car around during commissioning process and confirm that no obstacle hinders the car running throughout the shaft.
4.	Through the car top inspection operation, confirm the shaft end terminal Dec. switch action and the action in correct position.
5.	Through the car top inspection operation, confirm that shaft leveling switch and leveling plate installation are correct. at every leveling position, each leveling switch action point is correct.
Note	*1. At car top inspection operation, you should always pay attention to the car whether encounter other obstacles. If so, stop in time.*
	2. At inpsection runtime, if the shaft switch is not installed in place, the system may alarm fault, which can be shielded by parameter F26.12 (inspection parameter setting).

8.2.5 Shaft Self-learning

Before high speed running, the elevator must do shaft self-learning.	
1.	The elevator is in inspection state.
2.	Makes the elevator arrive to the lower limit position, and ensure that the down forced Dec. signal is valid and the present floor is floor 1.
	Note 1. For a total of two floors self-learning, you need to ensure that the down leveling switch is under the leveling plate.
	2. For the total floors are greater than two, there is at least one leveling switch in the leveling plate.
3.	Setting F26.01 as 1 (start shaft self-learning) by the keypad, then the elevator starts the shaft self-learning (or by using small keypad enter group F7 to set zero as 1 (start shaft self-learning)).
4.	At shaft self-learning, the elevator runs at shaft self-learning speed (F04.03), and records the leveling plate length, each floor height and up/down forced Dec. switch position.
5.	When the elevator runs to the upper limit bit, it will automatically stop. If there is no fault alarm, indicate the completion of the self-learning process.
Note	
1.	*Check F19.12 - F19.17 to confirm that you learn the correct forced Dec. position. Check group F20 parameters to confirm whether learning the correct floor data.*
2.	*Check D04.02 and D04.03 are consistent with the actual.*
3.	*Check D06.06, D06.07 and D06.08 are consistent with the actual.*
4.	*After adjust the leveling plate or the forced Dec. switch position, must restart the shaft self-learning.*
5.	*The shaft self-learning can be interrupted in the following cases: 1) the inspection switch switches to normal position, this time alarms self-learning fault. 2) operation fails.*
6.	*If the shaft self-learning is unsuccessful, you may refer to the reason 9.1 Troubleshooting (page 194).*

8.2.6 Check before High Speed

Check the System Communication	
1.	The CAN1+ and CAN1- communication terminals of MCB SK3 terminal are respectively connected to the CAN+ and CAN- communication terminals of CTB. The MOD+ and MOD- communication terminals of MCB's SK3 terminal are respectively connected to the MOD+ and MOD- communication terminals of HCB.
2.	In case of system power down, the measuring impedance between CAN1+ and CAN1- should be 60Ω. If there is a short circuit, please exclude it. If the impedance is wrong, check the selective switch on each board terminal resistor.
3.	After power up, determine whether normal communication through the LED indicators under the MCB's small keypad. The evenly blinking LEDs are normal. Of which: • The "COP" lamp displays the communication status of MCB and CTB; • The "HOP" lamp displays the communication status of MCB and HCB.
Set the Car and Hall Call Address	
The setting method of HCB's address of NL3000-HCB-H, NL3000-HCB-F and NL3000-HCB-D	
1.	After the long press HCB's SW1 button, floor display starts flashing, 3s later, floor display does not flash, then the floor address can be modified through up/down buttons.
2.	Set the required floor, and then press the SW1 button or directly wait for 5s, floors start flashing again, this time indicates HCB address setting success, after flashing 3s, return to the normal display state.
The setting method of HCB's address of NL3000-HCB-I	
1.	Set jumpers and jump out floors, floor display starts flashing, unplug the short wiring and after floor display does not flash, you can modify the floor address through up/ down button.
2.	Set the required floor, and wait for 5s, floors start flashing again, this time indicates HCB address setting success, after flashing 3s, return to the normal display state.
Address settings for the MCB software version above 1.07. HCB software version above 1.6.	
Set the address of HCB in the following way, not need to remove the LOP (described as NL3000-HCB-H).	
1.	Set the MCB board parameters F26.31 to 1, when HCB can normally display (HCB direction digital tube display T, floor digital tube display current HCB address), press the up and down buttons together for 3s, or continiousely press the up / down button for 6s, then the direction of digital display content is empty, the floor display began to flash, after 3s, the floor display does not flash, press the up / down button to modify the floor address.
2.	Set the required floor, wait for 5s, the floor began to flash again, this time that the call address set successfully, after flashing 3s, return to the external call check address display mode.

Car Call Board Address

The address setting method of car call board is the same with that hall call board, just set the address to 0.

Via the state parameters of group D, can check the car/hall call elevator signal, communication state and communication interference signal and so on, as following table.

Ref. Code	Function	Ref. Code	Function
D04.00	Present floor	D04.10	Registration state of 16 - 1 hall call down
D04.01	Present height	D04.11	Registration state of 32 - 17 hall call down
D04.02	Distance of lowest floor	D04.12	Registration state of 48 - 33 hall call down
D04.03	Distance of highest floor	D04.13	HCB communication state of 16 - 1
D04.04	Registration state of 16 - 1 car call floor	D04.14	HCB communication state of 32 - 17
D04.05	Registration state of 32 - 17 car call floor	D04.15	HCB communication state of 48 - 33
D04.06	Registration state of 48 - 33 car call floor	D04.16	Car communication state display
D04.07	Registration state of 16 - 1 hall call up	D04.17	Hall call Modbus communication interference evaluation
D04.08	Registration state of 32 - 17 hall call up	D04.18	Car top CAN communication interference evaluation
D04.09	Registration state of 48 - 33 hall call up	D04.19	Parallel CAN communication interference evaluation

Open/Close Door Debug

1. Turn the inspection switch to the inspection position. Set parameter for the door controller to ensure that its running curve is normal and output OD/CD arrival signal normally.
2. According to system configuration, connect the OD/CD arrival signal of the door controller to the control system.
3. Define the CTB multifunction output terminals as OD output and CD output terminals, and connect them to the run command input terminals of door motor inverter.
4. The elevator inspection opens to the leveling area.
5. The OD/CD command is given by the following three methods:
   - Via the up/down command, the elevator automatically closes the door. at the same time give the up/down command, elevator automatically opens the door.
   - Via the keypad, long press **RUN** key to open the door, and long press **STOP** key to close the door.
   - Via the car's OD/CD button to operate.
6. Check the door motor running direction whether correct, the OD/CD arrival signal whether normal, and the light curtain and touch board signal whether effective action.

Note

1. *The keypad can be debugged via the RJ45 interface of MCB or CTB or car call board.*
2. *Using the keypad checks the D05.00 and D05.01 so as to monitor door motor OD/CD arrival signal, light curtain signal and safe touch board signal etc.*
3. *In inspection mode, light curtain and safe touch board action do not open the door but can monitor the signal whether normal.*

8.2.7 High Speed Running

High Speed Running Precondition	
1. Door lock circuits are connected.	4. Floor storey data is correct.
2. No. 2 or 3-level fault at elevator.	5. F10.12 (Syn. motor initial angle) is not 0.
3. Door machine CD arrival signal is valid.	6. No over-load signal input.

High Speed Commissioning	
After fully validate the inspection running normally and shaft self-learning success, the high speed commissioning can be operated. After the shaft self-learning is completed, the system will automatically calculate the speed curve adapted to the elevator operation in accordance with the elevator floor distance, and automatically store to F19.07 - F19.11 (highest speed of curve). General users do not need to modify.	
1.	Turn the inspection switch to normal.
2.	Using keypad to set F26.00 (call elevator floor setting), and make single-floor, double-floor, multi-floor and full-floor automatic operation.
3.	To confirm the elevator normally switch door, Acc. and Dec., call elevator and parking.

Safe Test Running	
Safety circuit test	• At the elevator standby, and safety circuit is disconnected, the elevator can not run and alarm E0041 fault (safety circuit disconnection). • At the elevator running, and the safety circuit is disconnected, the elevator emergency stop and alarm E0041 fault (safety circuit disconnection). • After the safety circuit is closed, the fault is automatically reset.
Door lock circuit test	• At the elevator standby, and the door lock circuit is disconnected, the elevator can not run. • At the elevator running, and the door lock circuit is disconnected, the elevator emergency stop and alarm E0042 fault (door locked disconnection during running). • After the door lock circuit is closed, the fault is automatically reset.
Contactor adhesion protection	• The artificially created adhesions situation of system configuration such as: the run contactor, the brake contactor, the synchronous star-delta contactor, the locked-door contactor etc. can confirm that the system be protected.
Run timeout protection test	• At the inspection mode, operate the elevator to floors of non-leveling area, and removal of leveling signal line. • Turn the inspection switch to normal position, and the elevator returns to leveling floor at inspection speed. When the running time exceeds the preset time of F23.02 (largest floors run interval), the system will emergency stop and alarm E0040 fault (elevator run timeout).
Over-load function test	• Test requirements: the elevator overload switch action, check the elevator should not close, buzzer inside the car, car call board with overload display.

Split-level Protection Test	
The elevator is running to the middle floor, modify F19.01 (present floor) for other values and confirm that the elevator running to the top or bottom floor can normally decelerate without leveling hoisting or squatting. • Change F19.01 to a smaller number and call the elevator on the highest floor to confirm that the elevator will not be topped; • Change F19.01 to call the elevator on the lowest floor to confirm that the elevator will not bottom out.	
Note	
1.	*Do not set F19.01 as 1 or the heighest floor. otherwise it will alarm E0039 fault (down forced Dec. switch disconnection) or E0038 fault (up forced Dec. switch disconnection).*
2.	*When the forced Dec. acts, elevator will creep to the end station leveling area at speed of 0.100m/s. After the leveling signal is valid, by adjusting F03.14 (forced stop Dec. jerk) to ensure the leveling accuracy (F03.14 will automatically update after the shaft self-learning).*
3.	*If open the position deviation too large detection function (F26.24 = 1), when the elevator detect that position deviation is greater than the preset reference value (F26.25), elevator will immediately decelerate and creep to the leveling area at speed of 0.100m/s. After open the door, the elevator will automatically return to the base station at speed of 0.200m/s.*

8.2.8 Function Test

According to the actual needs, set group F26 (elevator function selections), and adjust group F21: parking base station (F21.00), fire base station (F21.01), Locked-elevator base station (F21.02), service floor (F21.07 - F21.09), time-sharing service (F21.10 - F21.19), peak time control (F21.20 - F21.25) and collective control (F21.26 - F21.33).
Auto Running Test
Register certain car call signals in the car Confirm that the elevator can normally close the door, start, run at high speed, and in the recent instruction registered floors can automatically slow down, stop, correctly eliminate number (elimination number of instructions and stopping floors should be the same), and open the door.
Register certain up/down hall call signals outside the hall Confirm that the elevator can normally close the door, start, run at high speed, and can normally stop, slow down, correctly eliminate number and open the door.
Driver Running Test
Open the driver running via F26.02 (driver function), while the factory default has opened this function.
Turn the car switch to the driver state and register certain car call signals Confirm that the continuous press on CD button will make the elevator close the door (if you release the CD button before the door closes, the elevator will immediately act from CD action to OD action till the door is opened). After the door is closed, the elevator will automatically start, run at high speed, and automatically decelerate in recent registered instruction floors, stop, correctly eliminate number and automatically open the door.
Register certain up/down hall call signals outside the hall Confirm that the continuous press on CD button will make the elevator close the door (if you release the CD button before the door closes, the elevator will immediately act from CD action to OD action till the door is opened). After the door is closed, the elevator will automatically start, run at high speed and normally automatic interception, decelerate, correctly eliminate number and automatically open the door.
Isolated Running Test
1. Open the isolated running function via F26.07 (isolated run), while the factory default does not have opened this function.
2. Turn the car switch to independent state, observe outside hall that should be no floor dispaly (or there is floor display with sign similar to "disable"), and call buttons should not work.
3. Register the instruction inside the car and continuous press on CD button will make the elevator close the door (if you release the CD button before the door closes, the elevator will immediately act from CD action to OD action till the door has opened). After the door is closed, the elevator will automatically start, run at high speed, and automatically decelerate in recent registered instruction floors, stop, correctly eliminate number and automatically open the door.
Firefighting Back to Base Station Function Test
1. Open the firefighting function via F26.03 (firefighting function), and the factory default has opened.
2. According to the actual situation, set F21.01 (fire base station). The firefighting switch can be connected to the firefighting input terminals of HCB, and also can be connected to the input terminals of MCB X1 - X24 (F12.01 - F12.24 setting).
3. Turn on the firefighting switch off fire base station switching, observe whether the elevator can normally return to fire base station and keep opening the door after arrived. • Advanced options parameter settings can be seen Bit3 and Bit6 of F26.16 (elevator enhanced function selection).

Fireman Running Function Test

1. Open the firefighting function via F26.03 (firefighting function), and the factory default has opened.
2. Fireman input terminals are defaulted as X8 interface input terminals of CTB COP, which can be connected to MCB input terminal X1 - X24 (F12.01 - F12.24 setting)..
3. After the elevator fire back to base station, and turn on fireman running switch (that is, to enter the fireman running state), the elevator will not automatically open or close the door.
   To close the door in the OD arrival state, you can continuously press CD button till the door is closed, and then release the button, the elevator will remain closed.
   - If release the CD button when the door is not yet closed, the elevator will be changed to OD action till there is OD arrival.
4. At the fireman running mode, each time only one car call floor instruction can be registered.
   If there is instruction signal registration, the elevator will immediately auto-start, run at high speed, and will decelerate, stop and eliminate number on the registration instruction floor.
   - At stopping the elevator does not open the door, only when you continue to press the OD button can the elevator open the door. The elevator can not keep the door opening until there is OD arrival.
   - If you release the OD button halfway, elevator will immediately go from door opening to door closing operation till the door is closed.
5. In the fireman operating state, the hall call button signal does not work. Only when stopping at the fire base station, the elevator in OD arrival state, and firefighting and fireman switch is reset, can the elevator return to the normal operating state.
   - Advanced options parameter settings can be seen Bit4 and Bit5 of F26.16 (elevator enhanced function selection).

Auto Return to Leveling Running

Due to a fault or other reasons the elevator stops to a non-leveling area, after meet the running conditions, the elevator will run at speed of 0.200m/s to the near leveling area;

when arrive to the leveling area (wherein one switch is actuated, and another switch is unactuated), the elevator running speed is the re-leveling speed (F04.04);

when two leveling floors are effective, after the elevator delays the time of F26.30 (return leveling and stop delay), it will decelerate to stop at inspection decelerated speed (F03.07).

The relevant parameters are set as follows in table.

Ref. Code	Function	Recommended	Remark
F03.07	Inspection Dec. speed	1.000m/s^2	
F04.04	Re-leveling speed	0.040m/s	
F26.30	Return leveling and stop delay	0.100s	Automatic update after shaft self-learning

8.2.9 Adjustment for Comfortable Feeling

The Elevator Started with a Sense of Frustration

Fault Phenomena and Investigation

Fault phenomenon

When the elevator starts, the car has a sense of frustration.

Troubleshooting

Possible Cause		Detection Method	Processing Measures	Note
Parameter setting problem	The pretorque is not opened	Check whether the parameter Settings are reasonable	set parameter related with pretorque	1
	Brake opean slowly	whether the elevator starts with the brake	Check brake open time and increase F02.01	
	Brake not open fully	Observe opening clearance	Adjust gap	2
Guide shoe is too tight, static friction force is too big		Try shaking the car and feel the gap between guides	Adjust guide shoe clearance, add guide rail oil or adjust speed loop PI	3

Note

1. How to set pretorque parameter

For brake itself, the opening time is different, while the brake response time is affacted by the ambient temperature (too high brake coil temperature will cause the brake delayed response), the appropriate increase in curve run delay time F02.01. The The pre-torque parameter is set below:

Ref. Code	Function	Seting Range	Default	Note
F02.01	Curve running delay time	0 - 2s	0.5s	*Elevator brake opened and then after F02.01 time, to run again*
F05.00	Start pretorque selection	0: No pretorque 1: Analogue weighing 2: Digital weighing 3: Pretorque auto-compensation	0	*According to requirement, select the pre-torque compensation function, generally selected 3*
F05.16	No weighing current coefficient	0 - 9999	3000	*Slipping in starting, increase F05.16-F05.18, too high value will cause oscillation*
F05.17	No weighing speed loop	1 - 9999	1000	
F05.18	No weighing speed loop KI	1 - 9999	1000	

2. The problem of brake interval

- Step 1: Confirm the brake can open, brake power is enough and brake coil loop is connected.
- Step 2: Make sure that the brake opening clearance is sufficient. If the brake is fricting, adjust the brake clearance.
- Step 3: Check the brakes on both sides is synchronized, if not synchronized, please adjust it into the synchronization.
- Step 4: The brake opening sound is too loud, if so, please make the sound small.

3. Boot shoes too tight, static friction is too large

Step 1: ensure whether the boots are too tight, if too tight, adjust the boots.

Step 2: adjust the parameters, the starting speed or adjust the speed loop PI to overcome the static friction, the parameters are as follows:

Ref. Code	Function	Setting Range	Default	Note
F02.02	Starting speed	0 - 0.030S	0	*Define the initial speed of the system starting, the appropriate starting speed can overcome the static friction*
F02.03	Keeping time of starting time	0 - 2S	0	*The holding time of the starting speed*
F02.06	Start ramp time	0 - 2S	2	*Define the time required (F00.03) for the elevator to accelerate from zero speed to the rated speed of the elevator, in conjunction with F02.02*
F08.00	Low speed loop KP	1 - 9999	500	*Increase the PI parameters, you can increase the dynamic response of the system, too high will cause oscillation*
F08.01	Low speed loop KI	1 - 9999	500	

Run With Jitter

Fault Phenomena and Investigation

Fault phenomenon

In the process of Acc. and Dec., there is up and down jitter. In constant speed, there is the upper and lower jitter.

Troubleshooting

Possible Causes	Detection Method	Treatment Measures	Note
guide shoes too tight, the friction is too large	Use the curve running delay time (F02.01) to determine the jitter is caused in starting of the opening or the curve caused	Adjust the gap between the guide shoe and the guide rail, reduce friction; increase the starting speed	1
Mechanical rotating parts	Check for periodic jitter	Adjust, replace mechanical parts	*Bearing*
Guid rail problem	Running, left and right shaking or relative fixed position jitter	Adjust the guide rail or the grinding joint	*Rail is not horizontal, there are foreign body, the interface is not flat*
System control (Acc. / Dec., constant speed jitter)	Whether there is periodic jitter, PI parameter is too small	Adjust PI parameters	2
There is a resonance in the running	The buzzing sound in the car running	Check for mechanical problems or adjust PI parameters	

Note

1. How to judge it is starting slip or jitter caused in beginning of curve running

Set F02.01 the curve running delay time as the maximum, that is, the elevator will run after the brake open and F02.01 so you can distinguish it is caused by jitter or curve beginning.

- If it is starting jitter, the elevator will stabilize at zero speed for F02.01 and then start running.
- If the jitter is caused in S curve, the elevator will wait for F02.01 in the quiescent state after the brake is opened.

2. System control problems

the jitter during Acc. and Dec. or constant speed during, adjust the PI parameters are as follows:

Ref. Code	Function	Setting Range	Default	Note
F08.00	Low speed loop KP	1 - 9999	1000	*Jitter within frequency 1, to increase F08.00 / F08.01. jitter above frequency 2, to increase F08.02 / F08.03. between frequency 1 and frequency 2 to take average value of two low-speed PI and two high-speed PI;* *Too big parameter adjustment will cause oscillation*
F08.01	Low speed loop KI	1 - 9999	500	
F08.02	High speed loop KP	1 - 9999	1500	
F08.03	High speed loop KI	1 - 9999	500	
F08.04	Speed loop PI switching frequency 1	0 - 50Hz	3	
F08.05	Speed loop PI switching frequency 2	0 - 50Hz	5	
F09.00	Current loop KP	1 - 4000	500	*Appropriate increase will improve jitter, but this parameter adjustment may lead to excessive system overcurrent*
F09.01	Current loop KI	1 - 4000	500	

Note: F10.20 Bit15 = 1 When oscillation suppression function is activated, it can be adjusted by F09.04 (loop parameter) and F18.00 (carrier frequency) to avoid the mechanical resonance point.

Running Curve Adjustment

Acc. and Dec. Curve (S Curve) Adjustment

NL3000 do Acc. and Dec. in S curve, so that the impact of x Acc. and Dec. will be the minimum, start and stop will be more smooth.

But different applications need to use different curve parameters of Acc. and Dec. Too big Acc. and Dec. will affect the comfort. and if too slow, will reduce the elevator operating efficiency.

Please adjust F03.00 - F03.05 when the Acc. / Dec. is slow, otherwise increase F03.00 - F03.05.

- Acc. / Dec. (F03.00 / F03.03): Rate of change in speed.
- Acc. / Dec. (F03.01, F03.02 / F03.04, F03.05): Rate of Acc. / Dec.

Frustration in End Station

Fault Phenomena and Investigation

Fault phenomenon

The elevator is running to the position of forced Dec. switch, the rapid speed to the leveling area in crawl speed.

Troubleshooting

Possible Cause	Detection Method	Remedy	Note
Forced Dec. switch problem	Check whether the switch action is normal	Replace the switch	
	Check whether the circuit is normal	wiring	
Forced Dec. switch distance problem	Check the forced Dec. switch installation distance	Adjust the installation distance	1
rope slips	Check rope slip	Adjust the mechanical part	2
Incorrect mechanical parameter setting	Check whether the mechanical parameter F00.06 is accurate	Modify the mechanical parameters as well as the actual mechanical parameters	

Note

1. Installation distance

The calculation of the installation distance S of forced Dec. switch and the end station leveling position:

$$S > \frac{V^2}{2 \times F03.12}$$

Rated Speed (m/s)	0.25	0.4	0.5	0.75	1	1.5	1.6	1.75	2	2.5	3	3.5	4
First-level Forced Dec. Distance (m)	0.4	0.4	0.4	0.4	0.7	1.4	1.5	1.8	2	2	2	2	2
Secondary Forced Dec. Distance (m)	no	no	no	no	no	no	no	no	2.5	4	4	4	4
Third Forced Dec. Distance (m)	no	no	no	no	no	no	no	no	no	no	6	8	11

2. Rope slips

Step 1: Check the steel wire rope is too much oil out, if so, use cloth to clean.

Step 2: Setting angle of Wire rope and traction wheel is reasonable

Step 3: Elevator balance system is correct, if not correct, first do the balance system, usually between 0.4 - 0.5.

Frustration in Stop

Fault Phenomena and Investigation

Fault phenomenon

When the elevator is running normally, the car has a sense of frustration.

Troubleshooting

Possible Cause	Detection Method	Remedy	Note
Door lock disconnection in the moment of stop	Check the gap between the door knife and the doorball	Adjust the gap	
System fault	View the fault	Processing failure	
Can not catch up with speed loop PI	Reinforce PI parameters	Appropriate increase F08.00 / F08.01	*Increase PI parameters, the system response quickly, too high value will cause oscillation*
The brake is closed slowly	Adjust brake brake force	Adjust the brake brake force, brake no resistance	
	Cancel the renewal delay	Ensure that the brake contactor is released and the brake is turned off immediately	
	Observe whether the car has a slip	Increase the stop zero speed hold time F02.05	1

Note

1. Why increase the stop zero speed hold time

As the brake coil is powered for a long time, slow brake releasing is caused by heat, after running contactor release (the system does not output torque), the brake has not been fully closed, resulting in slipping, there is a sense of frustration.

At this time, need to increase the torque output when stopping, that is, increase the stop zero speed hold time F02.05.

Leveling Accuracy Adjustment

Leveling Accuracy Adjustment

1. First to ensure that installation of the leveling plate is accurate. And the length of each leveling plate should be the same.
2. The speed loop parameter (F08 group) also has an effect on the leveling accuracy, ensuring that no overadjustment occurs.
3. Encoder interference has also an effect on leveling accuracy. Make sure that the encoder signal is good.

the leveling accuracy adjustment method is as follows in normal operation:

No.	Method
1	F19.06 = 0 (direct stop mode 0) and can be fine-tuned by F19.03 (leveling distance adjustment). When the elevator stops, if exceeding layer, then reduce the F19.03, if less leveling, then increase F19.03.
2	F19.06 = 1 (direct stop mode 1), first to ensure that the elevator has a short crawling (creep distance is set by F19.03), and then set F03.13 (parking emergency Dec.) and F04.02 (crawling speed) To fine tune the leveling accuracy. • When the elevator stops, if exceeding layer, you need to increase F03.13. If less leveling, you need to reduce F03.13. • F03.13 parameters Users generally do not need to be changed, after the self-learning, it will automatically updates to ensure leveling accuracy.

New Elevator Test

New Elevator Test

After the new elevaor is installed, it is necessary to test the new elevator.

in the F25 group parameter, you can set up the number of elevator random operation or designated floor of the fixed operation mode.

8.2.10 UCMP Function

Application Background

levator car accidental motion protection (UCMP) function: In the case where the landing door is not locked and the car door is not closed, the car leaves the landing due to the failure of any single component of the host or drive control system that the car is safely operated. In case of accidental movement, the NL3000-AOB-C can detect the movement and trigger the brake to stop the movement.

The leveling board is installed and the layer signal is shown in Figure 5-3, page 53.

UCMP Test Method

Test Conditions	
The NL3000-AOB-C circuit board is configured, the related functions are fully set, the maintenance switch is valid, the elevator stops at the door position, the door is closed, and the door lock signal is closed.	
Steps	
1.	Switch the elevator to the inspection state.
2.	Turn on the UCMP test function and modify the keypad F15 = 1 or F25.04 Bit7 = 1.
3.	Disconnect the door lock signal (the control panel increases the door lock disconnect switch).
4.	Manually press and hold the up button or check the down button, seal the door contactor output, and the door lock is shorted. At this time, the elevator is normally inspected and started.
5.	After the elevator runs out of the door zone, the UCMP module will disconnect the door lock and short circuit. At this time, the elevator reports E65 (UCMP failure), and the elevator stops running.
The UCMP test was unsuccessful when: • 1. Not in service, door area, door lock closed state, keypad F15 is set to 1 (invalid). • 2. After the keypad F15 is set to 1, it will be run once or after power down (it will be automatically cleared). • 3. For double-door applications, F26.22 Bit13 is set to 0 (UCMP test software actively breaks the door contactor). • 4. Turn off the fault mask function: F16.05 bit7 is set to 0 (no E65 fault is masked). • 5. When the distance between the upper and lower limit signals of the elevator shaft and the leveling signal is relatively short, the UCMP test performs the overhaul test at the top level, or the UCMP test performs the maintenance test at the lowest level.	

Reset E65 Fault

1. F16.05 Bit10 = 1 (E65 fault power down automatic reset).

2. In the inspection state, return to the fault interface with the operation keypad and press **STOP** key to reset.

3. In the inspection state, the samll keypad (MCB board) F02 = 1, press **SET** key to reset.

8.2.11 Brake Force Detection Function

Parameter Setting

Ref. Code	Function	Setting Range	Default
F03.18	Brake force detection method	0: Invalid 1: Manual start detection 2: Automatic start detection	Asyn. motor is 0, Syn. motor is 2
F03.19	Brake force detection cycle	1 - 15 day	1 day
F03.20	Brake force detection time point	00:00 - 23:59	3:00
F14 Keypad	MCB board keypad start brake brake force detection	0: Invalid 1: Manual start detection	0
F19 Keypad	Shutdown and reset brake brake force detection	6 - 15: The brake torque can be modified, the corresponding value is 60 - 150% 16: Turn off the brake brake force automatic detection, reset E66 fault 17: Automatic detection of brake force for opening brake	0
F25.04 Bit8	Manually start the brake brake force detection	0: Invalid 1: Manual start detection	0
F04.14	Brake detection duration	1 - 10s	5s
F04.15	Brake detection torque	60 - 150%	100%
F04.16	Brake detection allows pulse size	1 - 99	5
F04.17	Brake detection success times	0 - 65535 *After the brake brake force detection is successful, add 1 to the original value*	0

Brake Force Detection Method

Method 1: Automatic Detection Process	
1.	When the elevator is in the automatic state, the safety circuit is normal and the door lock circuit is closed.
2.	Open the brake force automatic detection function: F03.18 = 2 or keypad F19 = 17.
3.	When the detection period is reached and the time is detected, after the internal and external call signals are responded to, the elevator stops in the leveling area, and the contactor output is operated to start the automatic detection of the braking force.
4.	The running contactor stops and the brake brake force detection ends.
5.	Check F04.17 and add 1 to the original value after the brake force detection is successful. If it fails, the MCB board reports E66 failure, and the value of F04.17 does not change.

Method 2: Manual Detection Process	
1.	1 When the elevator is in the automatic state, the safety circuit is normal and the door lock circuit is closed.
2.	Start the manual detection function: F03.18 = 1 or F25.04 bit8 = 1 or keypad F14 = 1.
3.	After responding to the internal and external call signal, the elevator stops in the leveling area, runs the contactor output, and starts the brake force detection.
4.	The running contactor stops and the brake brake force detection ends.
5.	Check F04.17 and add 1 to the original value after the brake force detection is successful. If it fails, the MCB board reports E66 failure, and the value of F04.17 does not change.
Method 3: Manual Inspection Process Under Inspection State	
1.	When the elevator is in the inspection state, the safety circuit is normal and the door lock circuit is closed.
2.	Start the manual detection function: F03.18 = 1 or F25.04 bit8 = 1 or keypad F14 = 1.
3.	Click the up button or check the down button to start the brake brake force detection. Run contactor output, start brake force detection
4.	The running contactor stops and the brake force detection ends.
5.	Check F04.17 and add 1 to the original value after the brake force detection is successful. If it fails, the MCB board reports E66 failure, and the value of F04.17 does not change.

Reset E66 Fault

Method 1	Redo brake brake force detection reset: F17.07 Bit3 = 0 (the fault cannot be reset automatically), the test must be done again in the automatic state until the test is successful.
Method 2	Manual reset in case of overhaul: F17.07 Bit3 = 1 (in manual state, reset manually), the operation keypad returns to the fault interface, press STOP key.
Method 3	Power down power up reset: F16.05 Bit10 = 1 (power down power up reset fault). 0: E65, E66 fault power failure can not be reset.
Method 4	Motherboard keypad reset: When the elevator is switched to the inspection state, the keypad F19 = 16 (turn off the automatic detection function), press **SET** key.

Close the Brake Force Test

The on-site brake brake force detection fails, avoiding the periodic detection report E66 fault, and the brake force detection function can be turned off after resetting the fault.

- Method 1: F03.18 = 0.
- Method 2: Keypad F19 = 16 (turn off the brake force detection function), press **SET** key.

8.3 Typical Application Notes

8.3.1 Power Failure Emergency Running Program

When the elevator is in use, if the system's power suddenly broke, passengers may be trapped in the car. For this situation, NL3000 designed a power failure emergency running program which is easy and convenient to fulfill.

NL3000 power failure emergency running program are separated into two modes according to the power source of the motor. They are **auto-running car and emergency power supply run.**

Descriptions

Auto-running Car	After the NL3000 receives a power-failure-rescue signal, you should jump out the U/V/W's wire of Syn. motor via star-delta contactor, use the prevent-force limits the car's running by Syn. motor jumps out stator coil, and then open the brake. That is a rescue-way's which the car is running slowly to get to the leveling position. During this process you should monitor the elevator's speed, when detect the leveling signal, it will keep opening the door, output buzzer and stop running.
Emergency Power Supply Run	Both the main circuit and work-power of NL3000 have adopted the emergency power supply for power failure emergency run. After NL3000 chooses the way of power failure rescue, it would run at emergency speed, the direction is the same to run direction of elevator light-load run. When detecting signal, it will open the door and stop running.

Difference of Two Power Failure Emergency Running Programs

It can be seen from two kinds of program descriptions:

- For the Syn. motor, elevator can choose auto-running car or emergency power supply to run.
- For the Asyn. motor, it can only choose emergency power supply to run.

In order to distinguish the two modes, their features are described in the following chart.

Mode	Source of Motor's Power	Work-power NL3000	Work-power of Elevator's Safety Circuit	Range	Other
Auto-running car	Syn. motor jumps stator coil	Using the emergency power which is greater than 220V (or inverter)	Using the emergency power which is greater than 220V (or inverter)	Syn. motor	Need the star-delta contactor to jump out U/V/W wire
Emergency power supply run	Emergency power supply run	Emergency power supply run	Emergency power supply run	Syn. or Asyn. motor	

Emergency Running Connection

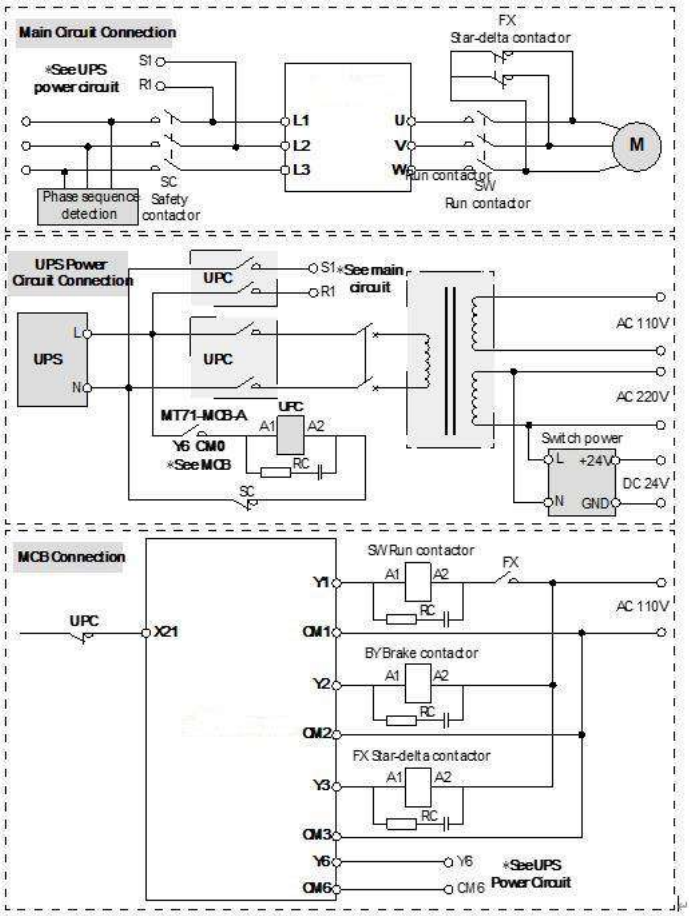


Figure 8-1 Mergency running connection

Auto-running Car Program

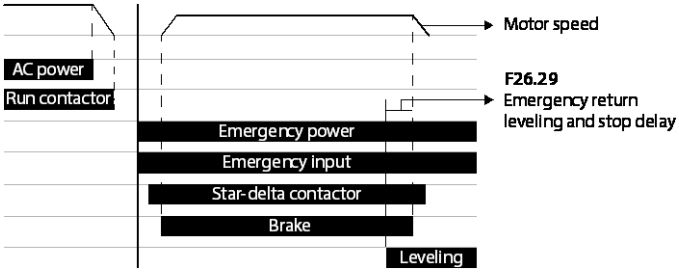


Figure 8-2 Auto-running car time sequence

Function Parameter Setting

According to Figure 8-1, setting parameters of auto-running car are as follows.

Ref. Code	Function	Setting Value	Meaning
F12.20	MCB input terminal X20	28	Battery driven NO input (UPC)
F12.30	MCB relay Y3 output terminal	4	Synchronous star-delta contactor output (FX)
F12.33	MCB relay Y6 output terminal	12	Power failure emergency run is enabled (UPC)
F26.19	Syn. motor star-delta contactor parameter setting	Set according to the actual	According to the synchronous star-delta contactor operation mode and control functions
F26.15	Battery-driven run parameter setting	Bit0 set according to the actual	Whether open the emergency operation timeout protection
		Bit1 = 1	Open the Syn. motor atuo-running car function

According to Figure 8-1, parameters of emergency power supply running are as follows.

Ref. Code	Function	Setting Value	Meaning
F12.20	MCB input terminal X20	28	Battery driven NO input (UPC)
F12.33	MCB relay Y6 output terminal	12	Power failure emergency run is enabled (UPC)
F26.15	Battery-driven run parameter setting	Bit1 = 0	Do not open atuo-running car function
		Bit2 = 1	Automatically judge the direction of the emergency operation
		Bit13 = 0	Open the Syn. motor atuo-running car function

Auto-running Car Description

It can be seen from Figure 8-1 emergency running connection, normality, the UPC should have disconnected, this time, when the UPS is charging, the system's power comes from main power supply.

When the main power is cut off, the controller's bus voltage is reduced to a certain value and the MCB Y6 relay outputs (the user may also manually switch), this time the UPC is closed, and the UPS power is supplied to system power.

When NL3000 receives the UPS valid signal of X20 input, and make sure that the mode is power failure emergency run, Y3 output makes the star-delta contactor close, then open the brake, the elevator will auto-running slowly. at the same time monitor elevator speed till leveling.

Note:

1. *During the auto-running is run, the NL3000 can't control the motor drive, the power of life auto-running is come from self-supply power of Syn. motor.*
2. *During the auto-running is run, if the elevator's speed is more than 1/2 rated speed, the NL3000 will alarm E0032 fault (motor over speed), don't be controlled by auto-running, and at the same time the star-delta contactor of Syn. motor maybe get abnormality.*
3. *The auto-running car emergency program is only applied to Syn. motor, and never be applied to Asyn. motor, otherwise, it will be very dangerous;*
   The auto-running car emergency program need some gap between load in the car and load of elevator balance. otherwise, the elevator run-speed will be slow.
4. *At auto-judging direction of the emergency power supply to run, it will automatically open the brake. When the car auto-running direction is detected, it will automatically run to the light load direction.*

8.3.2 Open-through Door Application

The open-through door control is mainly used in the same floor needing two doors or the car inside needing double car call occasions.

The open-through door control mode is as following table:

Control Mode	Set Parameter	Function Description
Open-through door simultaneous control	F26.21 = 0 (do not open the open-through door control) F22.17 = Any value	• Front and rear door hall call button parallel connection can achieve open-through door at the same time control, up to 48 floors.
	F26.21 = 1 F22.17 = 0	• Front and rear door buttons are separate, the front door hall call address is set as 1 - 24, and the rear door hall call address is set as 24 + front door address (25 - 48), up to 24 floors. • The open-through doors are consistent, open and close the door at the same time.
Open-through door control mode 1 (hall call separately, car call consistent)	F26.21 = 1 F22.17 = 1	• Front and rear door buttons are separate, the front door hall call address is set as 1 - 24, and rear door hall call address is set as 24 + front door address (25 - 48), up tp 24 floors. • At this mode, hall call is separate, front door hall call arrival opens the front door, rear door hall call arrival opens the back door, both doors have hall call open door, and when there is car call arrival, both doors will open the door.
Open-through door control mode 2 (hall call separately, car call manually control open-through door)	F26.21 = 1 F22.17 = 2	• Front door hall call address is set as 1 - 24, rear door hall call address is set as 24 + front door address (25 - 48), up to 24 floors. • At this mode, the front/the rear door hall calls are separate. The front door hall call arrival or call elevator opens the front door, and the rear door hall call arrival or call elevator opens the back door. Both doors have hall call open door, and when there is car call arrival, opening the front door or the rear door can be controlled via the front/back door switches inside the car. (it needs that one of group F13 input terminals is defined as No. 22 function)

Control Mode	Set Parameter	Function Description
Open-through door control mode 3 (hall call separately, car call separately)	F26.21 = 1 F22.17 = 3	• Apply to double calling boards, double COPs and two CCBs in parallel. The front and the back doors can be cascaded CCB, up to 24 floors. • The setting method and the operation of hall call are the same as open-through door control mode 1. • The front door car call command is CCB1's JP1 - JP16, the rear door car call command is CCB2's JP1 - JP16. • Through the main COP input terminal can customize OD button (the front door opens the door) and CD button (the front door closes the door). The vice COP multifunction terminals define rear door OD button and rear door CD button. • The front door OD button action is to open the front door, and the rear door OD button action is to open the back door. The CD button will work on the front/back door close. • The car call is separate control. The front door car call arrival is to open the front door, the rear door car call arrival is to open the back door, and when front and rear door car calls are arrival, both doors are open.

Note:

At firefighting, inspection and back leveling floor modes, the open-through door does not separately control, but can simultaneously control.

Description of Double Hall Calls At the Same Floor

If some floors of the elevator need to configure dual hall calls, NL3000 provide appropriate solutions.

- Connect door 2 (back door) HCB to the Modbus bus, the hall call address setting method of door 2 is the front door address plus 24;
- Set parameter F26.21 to 1 (open the open-through door control), and reasonable set F22.17 (open-through door control mode) according to the actual configuration of the open-through door.

Description of Double Car Calls Inside the Car

The double car calls inside the car have two cases.

- If there is only one door, the significances of the two car calls are the same. The button simply wired in parallel can be achieved.
- If there are two doors, the usage refers to section 8.3.2 Open-through Door Application and the connection refers to section 4.4 Car Command Board.

Group Control Board Description

Details refer to "NL3000-GCB-A Group Control Board User Manual".

8.3.3 Manual Door Application

Application Background

The car door and the hall door applied to the elevator are all hand-drawn doors, or the elevator only uses the hall door as the hand-drawn door (without the car door).

The door is locked by a solenoid valve to lock the hall door. The door lock is closed, the solenoid valve is closed, the call signal is received, and the elevator is running.

Features

This function is available only for the NL3000 MCB board software version V2.09 and above (D00:03 ≥ 2.09).

- 1. The door lock is disconnected and the 5s beep output reminder.
- 2. The solenoid valve function is controlled as shown in the hand-drawn door flow chart. (Remark: After opening the function of the hand-operated door solenoid valve, F12.38 bit11 = 0 can be set to close the semi-automatic door function).
- 3. Front and rear door pull door functions: front door automatic door, rear door pull door. or front door pull door, rear door automatic door.
  The hand-operated door is handled by the hand-operated door action process, and the automatic door is processed by the automatic door action process. (the number of door machines needs to be set F22.00 = 2)
- 4. Pull the door to the next start time for a minimum of 1s.
- 5. The door lock can be used with high-pressure or low-pressure door locks. See the table below for detailed parameters.
- 6. Clear the internal and external call registration command time for the solenoid valve action Max. time: (8s+8s) * 8 = 128s, ie (solenoid valve pull-in time + solenoid valve open time) × solenoid valve action times.

Parameter Setting

Ref. Code	Function	Range	Default	Suggestion
F26.16 Bit9	Enable manual door funciton	0: Disable 1: Enable	0	1
F26.22 Bit11	Manual door lock disconnects buzzer reminder function	0: Not remind 1: Remind	0	1
F12.26	High voltage input X26 (car door lock)	0 - 4 2: High pressure door lock 1 3: High pressure door lock 2 *If using a low-pressure door lock, set to 6/106 (low-pressure car door lock), 7/107 (low-pressure hall door lock)*	0	2
F12.27	High voltage input X267 (hall door lock)		0	3
F12.34 - F12.51	MCB board output Y1 - Y6	0 - 28 27: MCB board solenoid valve	0	27
F13.25 - F13.31	CTB board output Y1 - Y6	0 - 32 31: Car top r-cam	0	31

Ref. Code	Function	Range	Default	Suggestion
F12.38 Bit0	The door lock is broken and the internal and external calls are displayed	0: Normal display 1: Hand-drawn door reminder display • When set to 1, "C" and "floor" are displayed if the car door is not closed, and "L" and "floor" are displayed if the hall door is not closed	0	1
F12.38 Bit3&Bit2&Bit1	R-cam suction time	1 - 8s 000 = 1s …… 111 = 8s	0	3
F12.38 Bit6&Bit5&Bit4	R-cam disconnection time		1	2
F12.38 Bit7	Door lock disconnection beep reminder condition related to call command	0: When there is a call command, the door lock disconnects and beeps 1: The door lock disconnects the beep to output a reminder	0	0
F12.38 Bit10&bit9& Bit8	R-cam action times	1 - 8 times 000 = 1 time …… 111 = 8 times	1	3
F12.38 Bit11	Semi-automatic door pull function	0: Normal shutdown 1: The door door lock will not close until closed	0	0
F12.38 Bit12	Manual door R-cam function output mode	0: Always output 1: Interval output	0	1
F12.38 Bit14&Bit13	Double door front and rear door pull function	00: Close function 01: Double door front door automatic door rear door pull door 10: Double door front door pull door rear door automatic door	00	00
Pull the door to the next start time (s) = (F22.07 + F22.08) / 2 + F22.11 + F22.12, the minimum is 1s.				

Manual Door R-cam Setting (Using Car Door and Hall Door Lock Signal Control)

Note: The relevant terminal can set the corresponding parameters according to the field wiring.

Case 1: The hall door and the car door are manual doors, and the hall door has R-cam (the hall door door lock signal is used as the R-cam feedback signal)

R-cam Action Way	High Voltage Door Lock Signal	Low Voltage Door Lock Signal
Method 1: Door lock is not closed, R-cam interval output	Car door lock signal F12.26 X26 = 2 Feedback signal F12.27 X27 = 3	Car door lock signal F12.23 X23 = 6/106 Feedback signal F12.24 X24 = 7/107
Method 2: The door lock is not closed, R-cam does not output	Car door lock signal F12.26 X26 = 3 Feedback signal F12.26 X27 = 2	Car door lock signal F12.23 X23 = 7/107 Feedback signal F12.24 X24 = 6/106

Case 2: The hall door and the car door are hand-drawn doors, and the hall door has R-cam (no R-cam feedback signal)

R-cam Action Way	High Voltage Door Lock Signal	Low Voltage Door Lock Signal
Method 1: Door lock is not closed, R-cam interval output	Hall door lock signal F12.26 X26 = 3	Hall door lock signal F12.23 X23 = 7/107
Method 2: The door lock is not closed, R-cam does not output	Hall door lock signal F12.26 X26 = 2	Hall door lock signal F12.23 X23 = 6/106

Case 3: The hall door is a hand-drawn door, the hall door has R-cam (no R-cam feedback signal), no car door

R-cam Action Way	High Voltage Door Lock Signal	Low Voltage Door Lock Signal
Method 1: Door lock is not closed, R-cam interval output	Hall door lock signal F12.26 X26 = 3	Hall door lock signal F12.23 X23 = 7/107
Method 2: The door lock is not closed, R-cam does not output	Hall door lock signal F12.26 X26 = 2	Hall door lock signal F12.23 X23 = 6/106

Case 4: The door is a hand-drawn door, the hall door has R-cam (no R-cam feedback signal), no car door

R-cam Action Way	High Voltage Door Lock Signal	Low Voltage Door Lock Signal
Method 1: Door lock is not closed, R-cam interval output	Hall door lock signal F12.26 X26 = 2 Feedback signal F12.27 X27 = 3	Hall door lock signal F12.23 X23 = 6/106 Feedback signal F12.24 X24 = 7/107
Method 2: The door lock is not closed, R-cam does not output	Hall door lock signal F12.26 X26 = 3 Feedback signal F12.26 X27 = 2	Hall door lock signal F12.23 X23 = 7/107 Feedback signal F12.24 X24 = 6/106

8.3.4 Description of Over-load and Full-load

NL3000 supplies many over-load and full-load signals inputting modes.

When in use, correctly set the corresponding parameters. Briefly explain its use in the following:

Analogue input terminal inputting method	Via MCB or CTB input terminal select over-load and full-load signal input, changing NO/NC set can match different types of switches.
Analogue weighing signal inputting method	NL3000 has two anglogue signal input channels: MCB's AI terminal and CTB's AI terminal. • The analog can do weighing self-learning, which is referred to section 7.2.6 F05: Weighing Compensation Parameters (page 91). • When analog weighing signal is more than 80% of the full-load signal, which is a full-load signal. If more than 110%, it is the over-load signal.

Note:

1. As long as the full load and overload signals are selected in the input terminals of the MCB board or the car top board, the overload and full load signal inputs will work.

2. The analog weighing signal can only be set on one circuit board, that is, the MCB board and the car top board are selected one by one, and not both boards can be set, and conflict will occur.

3. This switch can be used with analog weighing.

Chapter 9 Troubleshooting and Maintenance

9.1 Troubleshooting

Ault Sort Explanation

NL3000 has almost 60 pieces of protection functions.

NL3000 monitors all kinds of input signal, running condition etc. If some abnormal error happens, relevant fault protection functions will act and the system controller will display the fault code.

Error information produced by NL3000 can be divided into 4 sorts according to their influence to the system. Different fault has different disposal mode, which is as shown in the next table.

Fault Sort	Relevant Disposal	Remark
Level 1 fault	• Display fault code • Error relay output action	Any kind of working condition will not be influenced
Level 2 fault	• Display fault code • Error relay output action • Stop at the nearest landing when in distance control, then stop running • Stop running at once in other work condition	After stop, the system will close off output at once, and close brake
Level 3 fault	• Display fault code • Error relay output action • The system blank off output at once, close brake and stop running	Forbid running
Level 4 fault	• Display fault code • Error relay output action • forbiden fast running • allow slow running	forbiden fast running

Fault Code Description

The fault's display code, cause, countermeasure and sort are seen in Table 9-1.

The keypad displays five data: E+ Fault code

The MCB's small keypad displays three data: E+ Fault code

9.1.1 Faults and Countermeasures

Table 9-1 Fault content and countermeasures

Lu (Lu): DC bus undervoltage	**Level 3**	Countmeasure
Fault reasons: 1: Power-on initial state, power down end state 2: Input voltage is too low 3: Unregulated wiring leads to hardware undervoltage 4: Model setting error		1: Normal power up/down state, normal 2: Check the input supply voltage 3: Check wiring, standard wiring 4: Set the model correctly (Y00.01)
E0001 (E01): Controller output Acc. overcurrent	**Level 3**	Countmeasure
Faulty subcode: 101: Software Acc. overcurrent 102: Hardware Acc. overcurrent 103: Motor overcurrent software accelerates overcurrent 104: Short circuit caused by overcurrent during Acc	Fault reasons: 1: Main circuit output is grounding 2: Main circuit output is short wiring 3: The motor has not done parameter auto-tuning 4: Load is too heavy 5: Encoder signal is wrong 6: Encoder signal interference is serious 7: Acc. curve is too steep	1: Check the main circuit output side whether groud is short-circuited and output phase is short-circuited 2: Check whether the power wiring is damaged and the wiring is solid 3: Check wheter the motor internal exists a short circuit or shorted to ground 4: Outputside contactor is abnormal 5: Star-delta contactor causes NL3000 output short-circuited 6: Set the correct motor parameters (group F07 / F10) 7: Restart motor parameter auto-tuning (group F07 / F10) 8: Check whether the brake is abnormal 9: Check whether the mechanical is stuck 10: Check whether the elevator balance coefficient is correct 11: Check whether the encoder wiring is reliable 12: Set the correct encoder parameters (group F11) 13: Encoder is installed reliably 14: Check whether the encoder alignment is independence wear tube, trace distance is too long and the shielded cable is single-end grounded 15: Check whether the Acc. / Dec. curve (group F03) is too large
E0002 (E02): Controller output Dec. overcurrent	**Level 3**	
Faulty subcode: 201: Software Dec. overcurrent 202: Hardware Dec. overcurrent 203: Motor overcurrent software decelerates overcurrent 204: Output short circuit causes OC	Fault reasons: 1: Main circuit output is grounding 2: Main circuit output is short wiring 3: The motor has not done parameter auto-tuning 4: Load is too heavy 5: Encoder signal is wrong 6: Encoder signal interference is serious 7: Dec. curve is too steep	
E0003 (E03): Controller output constant speed overcurrent	**Level 3**	
Faulty subcode: 301: Software zero speed or constant speed over current 302: Hardware zero speed or constant speed over current 303: Motor overcurrent software constant speed overcurrent 304: Short circuit caused by overcurrent during zero speed or constant speed	Fault reasons: 1: Main circuit output is grounding 2: Main circuit output is short wiring 3: The motor has not done parameter auto-tuning 4: Load is too heavy 5: Encoder signal is wrong 6: Encoder signal interference is serious	

E0004 (E04): DC bus voltage Acc. overvoltage	Level 3	Countmeasure
Fault reasons: 1: Input voltage is too high 2: Acc. curve is too steep 3: Brake resistance is too much 4: Braking unit is abnormal 5: Power feedback is abnormal		1: Adjust the input voltage, check whether the bus voltage (D01.06) is normal 2: Check the balance coefficient 3: Select the appropriate braking resistor, refer to section 5.6 Braking Resistor Selection (page 50) 4: Connect with braking unit or power regenerative unit, check the related equipment
E0005 (E05): DC bus voltage Dec. overvoltage	**Level 3**	
Fault reasons: 1: Input voltage is too high 2: Acc. curve is too steep 3: Brake resistance is too much 4: Braking unit is abnormal 5: Power feedback is abnormal		
E0006 (E06): DC bus voltage constant speed overvoltage	**Level 3**	
Fault reasons: 1: Input voltage is too high 2: Brake resistance is too much 3: Braking unit is abnormal 4: Power feedback is abnormal		
E0007 (E07): Static current is too high	**Level 3**	Countmeasure
Fault reasons: he current detected during the elevator stop process > Allowable static current F09.05		1: Check whether there is feedback load into the inverter output terminals 2: whether F09.05 parameter setting is too small 3: Set F09.05 = 0.0 to shield the fault
E0008 (E08): Power module faulty	**Level 3**	Countmeasure
Faulty subcode: 800: FO fault protection (edge trigger) 801: FO fault protection (level trigger) 802: FO fault caused by phase-to phase short circuit or short circuit to ground 803: FO fault caused by phase-to phase short circuit or short circuit to ground (level trigger) 804: Output short circuit leads to FO	Fault reasons: 1: Short circuit between phases output or the ground 2: Motor wiring is too long 3: Work environment is overheating 4: Power module is damaged	1: Check the wiring and regulate it 2: Install the reactor or filter 3: Check whether the fan and the ventilation duct are normal 4: Please contact the supplier for repairing
E0009 (E09): Heatsink overheated	**Level 3**	Countmeasure
Faulty subcode: 901: Software over temperature 902: Hardware over temperature	Fault reasons: 1: Ambient temperature exceeds specifications 2: The controller external ventilation is adverse 3: Fan is faulty 4: Temperature detection circuit is faulty	1: Derated for using and increase power 2: Rectify controller external ventilation 3: Replace the fan 4: Seek for technical support

<table>
<tr><td colspan="2">E0010 (E10): Braking unit faulty</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td colspan="2">Fault reasons: The braking circuit is faulty</td><td></td><td>Seek for technical support</td></tr>
<tr><td colspan="2">E0012 (E12): Parameter auto-tuning fault</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td colspan="2">Faulty subcode:
1201: Distance control for synchronous motor no-load auto-tuning
1202: Synchronous motor auto-tuning with load detection current is too small
1203: Synchronous motor auto-tuning with load timeout
1204: Stator resistance self-tuning current is too large
1205: Stator resistance auto-tuning timeout
1206: Rotor resistance auto-tuning timeout
1207: No-load current self-tuning is too small
1208: Aauto-tuning with load, the upper and lower limit switches are valid at the same time
1209: Aauto-tuning with load timing, when the upstream command is repaired, the upper limit switch action
1210: Aauto-tuning with load timing, when the downstream command is repaired, the lower limit switch action</td><td></td><td rowspan="2">1: Check the motor wiring
2: Input correct motor parameters (group F07 / F10)
3: Do the Syn. motor rotating auto-tuning under the keypad control (F00.07 = 0)</td></tr>
<tr><td colspan="2">Fault reasons:
1: Parameter auto-tuning timeout
2: Over current at parameter auto-tuning
3: Under the distance control (F00.07 = 1) doing Syn. motor rotating auto-tuning (F10.10 = 2)</td><td></td></tr>
<tr><td colspan="2">E0013 (E13): Soft start failed</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td colspan="2">Fault reasons:
1: Contactor fault
2: Control circuit fault</td><td></td><td>1: Replace the contactor
2: Seek for technical support</td></tr>
<tr><td colspan="2">E0014 (E14): Current detect faulty</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td>Faulty subcode:
1400: U phase, W phase current detection fault
1401: U phase current detection fault
1402: W phase current detection fault
1403: Current correction circuit failure
1404: Current correction input fault</td><td>Fault reasons:
1: Current detection circuit damage
2: Syn. motor is out of control
3: Encoder signal short circuit</td><td></td><td>1: Please contact the supplier for repairing
2: Check the brake signal</td></tr>
<tr><td colspan="2">E0015 (E15): Lack of input</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td colspan="2">Fault reasons: For three phase input controller, three phase input power phase loss</td><td></td><td>1: Check the three phase input power
2: Check the settings of parameter F17.00 and F17.01</td></tr>
</table>

E0016 (E16): Lack of output		Level 3	Countmeasure
Faulty subcode: 1600: Output phase loss detected during operation 1601: No output current detected during startup 1602: One phase output missing in VW phases is detected during startup 1603: One phase output missing in UW phases detected during startup	Fault reasons: 1: Controller three phase output broken or loss of phase 2: Controller with serious imbalance in three phase load		1: Check the wiring between controller and motor 2: Check the motor 3: Check the settings of parameter F17.02 and F17.03
E0017 (E17): Controller overloaded		**Level 3**	Countmeasure
Fault reasons: 1: Brake circuit abnormal 2: Load is excessive 3: Encoder feedback signal abnormal	4: Motor parameter error 5: Check motor power line		1: Check the brake circuit 2: Reduce the load 3: Check the encoder feedback signal 4: Check the motor parameters and restart the parameter auto-tuning (group F07 / F10) 5: Check the power line
E0018 (E18): Excessive speed deviation		**Level 3**	Countmeasure
Faulty subcode: 1801: Speed deviation level 1 1802: Speed deviation level 2	1803: Speed deviation level 3 1804: Speed deviation level 4		1: Check the brake contactor or the run contactor 2: Reasonably set encoder pulse parameter (F11.01) 3: Correctly set F04.11 (detected value) and F04.12 (detected time) 4: Select larger capacity controller 5: Correctly set speed-loop PI parameter (F08) 6: Check encoder wiring and installation 7: Check the motor parameter 8: Restart parameter auto-tuning
Fault reasons: 1: Brake contactor fault or run contactor fault 2: Encoder pulse number setting error 3: Excessive deviation of detection value and time setting unreasonable 4: Controller output torque is not enough	5: Speed-loop PI parameter setting is improper 6: Encoder signal error 7: Motor parameter error 8: F10.12 error 9: Encoder direction setting error, reverse F11.02		
E0019 (E19): Motor overloaded		**Level 2**	Countmeasure
Fault reasons: 1: Brake circuit abnormal 2: Motor overload protect factor set incorrectly	3: Load is excessive		1: Check the brake circuit 2: Correctly set motor overload protect factor (F17.04) 3: Reduce the load
E0020 (E20): Motor overheated		**Level 2**	Countmeasure
Fault reasons: 1: Motor is overheated 2: Motor overheating input signal action	3: Motor parameter setting error		1: Reduce the load 2: Detect whether the overheating input terminal signal is correct 3: Correctly set motor parameter (group F07 / F10)

E0021 (E21): MCB EEPROM read/write faulty	Level 3	Countmeasure
Faulty subcode: 2101: In-board EEPROM write data error 2102: Onboard EEPROM read data error 2103: In-board EEPROM read data error Too many times 2104: Onboard EEPROM read operation timed out 2105: Onboard EEPROM write operation timed out		Contact the supplier for repairing
Fault reasons: MCB EEPROM circuit failure		
E0022 (E22): Keypad EEPROM read/write faulty	**Level 1**	Countmeasure
Fault reasons: Keypad EEPROM circuit failure		1: Replace the keypad 2: Contact the supplier for repairing 3: Keypad manually reset to continue normal use (exclude parameter upload and download)
E0023 (E23): Parameter setting faulty	**Level 3**	Countmeasure
Faulty subcode: 2301: Syn. motor self-tuning selection F07.06 2302: Asyn. motor self-tuning selection F10.10 2303: F04.02 > F19.07 2304: F04.02 > F19.08 2305: F04.02 > F19.09 2306: F04.02 > F19.10 2307: F04.02 > F19.11 2308: F19.07 < 0.100m/s 2309: F19.08 < 0.100m/s 2310: F19.09 < 0.100m/s 2311: F19.10 < 0.100m/s 2312: F19.11 < 0.100m/s 2313: The fire station is set to the non-service layer 2314: The second fire station corresponds to the door motor as a non-service layer 2315: The idle base station is set to the non-service layer 2316: Locking station base station corresponding door motor is set to non-service layer 2317: F11.00 is set to 1 when the Syn. motor 2318: The rated current of the motor is set to 0 2319: F07.11 > F07.02 2320: F08.04 > F08.05 2321: The total thickness of the elevator's real and Max. floors is greater than 48 2322: The door motor does not serve when it is 1 minute, and the door motor does not serve when it is 2 minutes. 2323: MCB-A sets NL3000-PG4-SC-A encoder card 2324: Door machine 1 minute time no service time setting error 2325: CTB board input terminal No. 33 function setting repeat 2326: CTB board input terminal 34 number function setting repeat 2327: CTB board input terminal No. 35 function setting repeat 2328: CTB board input terminal set flat layer signal not together		1: At Asyn. motor parameter auto-tuning, set F00.07 = 0 (keypad control) 2: For the Syn. motor, F11.00 (encoder card selection) should be set as 2 (UVW encoder card) or 3 (SINCOS encoder card) 3: At Syn. motor auto-tuning with load, set F00.07 = 1 (distance control) 4: Correctly set motor current (F07.02 / F10.03) 5: Correctly set Asyn. motor no-load current (F07.11) 6: Restart to set F04.02 7: Restart to set F21.07 - F21.09 8: Change the door service floors (F22.01 - F22.06) into allow service

Fault reasons: 1: In the non-keypad mode Asyn. motor parameter auto-tuning to set parameters auto-tuning 2: Syn. motor selects ABZ encoder 3: Syn. motor auto-tuning with load, the operating mode is keypad setting 4: Motor current is set to zero 5: Asyn. motor no-load current setting value is larger than motor rated current	6: The creeping speed at distance control (F04.02) is larger than highest speed of running curve (F19.07 - F19.11) 7: 0.000m/s < F19.07 - F19.11 < 0.100m/s 8: Firefighting base station, locked-elevator base station and idle base station are set to non-service floor 9: Door service floors of firefighting base station, locked-elevator base station and idle base station are set to prohibit service	
E0024 (E24): Input voltage detection failure	**Level 1**	Countmeasure
Fault reasons: Input normal bus voltage, but the line voltage detection circuit is abnormal		1: Power down treatment 2: Contact to factory for repairing
E0030 (E30): Encoder reverse direction	**Level 3**	Countmeasure
Faulty subcode: 3000: Encoder reverse fault 3001: Static self-tuning with UVW encoder detects encoder reverse fault 3002: Static self-tuning SINCOS encoder detects encoder reverse fault	Fault reasons: 1: The preset speed direction is inconsistent with the actual direction 2: Load is too large 3: Controller output torque is not enough 4: Brake circuit abnormal 5: Run contactor abnormal	1: At elevator commissioning, F11.02 (encoder direction) value is reverse. during normal running, do not modify F11.02 2: Reduce the load 3: Select larger capacity controller 4: Check the brake circuit 5: Check the run contactor
E0031 (E31): Encoder disconnection	**Level 3**	Countmeasure
Faulty subcode: 3101: Encoder AB disconnected 3102: Self-tuning SINCOS encoder C+, C- disconnection 3103: Self-tuning SINCOS encoder D+, D- disconnection 3104: Self-tuning SINCOS encoder C+, C-, D+, D- disconnection 3105: SINCOS encoder C+, C- disconnection 3106: SINCOS encoder D+, D- disconnected	3107: SINCOS encoder C+, C- or D+, D- disconnected 3108: 1313 encoder communication failure 3109: 1313 encoder communication failure 3110: Static self-tuning with UVW encoder detected encoder disconnection fault 3111: Static self-tuning with SINCOS encoder detected encoder disconnection fault	1: Check the encoder wiring and encoder installed reliably 2: Check the brake circuit
Fault reasons: 1: Encoder without input signal 2: Brake circuit abnormal		

E0032 (E32): Motor over speed		**Level 3**	Countmeasure
Faulty subcode: 3201: Elevator speeding 3202: Self-driving elevator speeding 3203: Elevator running speeding 3204: Elevator overspeed detected when the all-in-one stops outputting	Fault reasons: 1: Encoder pulse number setting error 2: Controller output torque is not enough 3: Speed-loop PI parameter setting is improper 4: Encoder signal error 5: F10.12 error 6: Motor parameter error		1: Reasonably set encoder P/R (F11.01) 2: Select larger capacity controller 3: Correctly set speed-loop PI parameter (group F08) 4: Check the encoder wiring and encoder installed reliably 5: Restart parameter auto-tuning 6: Check motor parameter
E0033 (E33): Loss of Z signal of ABZ encoder		**Level 3**	Countmeasure
Faulty subcode: 3300: Z signal is abnormal 3301: UVW encoder static self-tuning reverse fault 3302: SINCOS encoder static self-tuning reverse fault	Fault reasons: 1: Wiring problem 2: Serious interference		Check the wiring
E0034 (E34): UVW signal wrong of UVW encoder		**Level 3**	Countmeasure
Fault reasons: UVW encoder sector confirmation is wrong			Whether the wiring of UVW is correct
E0035 (E35): CD phase wrong of Sincos encoder		**Level 3**	Countmeasure
Faulty subcode: 3500: Encoder C/D phase amplitude is too small 3501: Encoder C/D amplitude ratio is too large 3502: Encoder C/D is too biased 3503: Encoder C phase amplitude is abnormal 3504: Encoder D phase amplitude is abnormal 3505: Encoder C phase zero offset anomaly 3506: Encoder D phase zero offset anomaly	Fault reasons: 1: Encoder fault 2: Encoder disconnection		1: Check the encoder 2: Check the wirings of encoder C phase and D phase
E0036 (E36): Shortest distance ultrahigh		**Level 3**	Countmeasure
Faulty subcode: 3600: The shortest floor in front is super high 3601: The current floor distance is extremely short	Fault reasons: 1: Speed curve setting is inappropriate 2: Acc. / Dec. setting is inappropriate		1: Set appropriate speed curve (F19.07 - F19.11) 2: Set appropriate Acc. / Dec. curve parameters (F03.00 - F03.05)
E0037 (E37): Abnormal control board logic		**Level 3**	Countmeasure
Fault reasons: The MCB board logic is abnormal			Please contact the supplier for changing the main control board

E0038 (E38): Up forced Dec. switch disconnection	Level 3	Countmeasure
Fault reasons: Elevator on the top floor, up forced Dec. switch is turned off		1: Check the up forced Dec. switch 2: Restart shaft self-learning 3: Check the leveling switch signal
E0039 (E39): Down forced Dec. switch disconnection	**Level 3**	Countmeasure
Fault reasons: Elevator on the first floor, down forced Dec. switch is turned off		1: Check the down forced Dec. switch 2: Restart shaft self-learning 3: Check the leveling switch signal
E0040 (E40): Elevator run timeout	**Level 3**	Countmeasure
Fault reasons: Leveling signal without any change within F23.02 specified time		1: Elevator speed is too low, or floor height is too high 2: Leveling signal is abnormal 3: Steel wire skid
E0041 (E41): Safety circuit disconnection	**Level 3**	Countmeasure
Fault reasons: Safety circuit signal disconnection		1: Check the safety circuit switch, and view the status 2: Check the safety circuit power supply circuit 3: Check the safety circuit contactor signal 4: Check the safety circuit feedback contact signal characteristics (NO or NC)
E0042 (E42): Door locked disconnection during running	**Level 3**	Countmeasure
Faulty subcode: 4200: Running door lock disconnected 4201: Door lock disconnected during door closing operation 4202: Door lock disconnection failure causing overcurrent 4203: Door lock disconnection failure during auto-tuning 4204: Door lock disconnection failure during power failure emergency operation 4205: Start the hoistway self-learning door lock is not closed	Fault reasons: During elevator running process, the door locked signal is disconnected or the door lock adhesion detection signal is disconnected	1: Check whether the hall and the car door lock contact is normal 2: Check whether the door lock contactor action is normal 3: Check the door lock contactor feedback contact characteristics (NO or NC) 4: Check the door lock power supply circuit 5: If there is NL3000-AOB-A, check the corresponding signal 6: During the operation, the door lock adhesion detection signal is disconnected, and the door lock adhesion detection signal is checked
E0043 (E43): Up limit signal disconnection during running	**Level 3**	Countmeasure
Fault reasons: 1: The signal of up limit is cut off when elevator is up running 2: Encoder signal interference makes elevator position error		1: Check that the up limit switch contact is normal or not 2: Check the up limit switch signal characteristics (NO or NC) 3: Up limit switch installed low, normal run to the top will be action 4: Check encoder wiring and installation

E0044 (E44): Down limit signal disconnection during running	**Level 3**	Countmeasure
Fault reasons: 1: The signal of down limit is cut off when elevator is down running 2: Encoder signal interference makes elevator position error		1: Check that the down limit switch contact is normal or not 2: Check the down limit switch signal characteristics (NO or NC) 3: Down limit switch installed high, normal run to the bottom will be action 4: Check encoder wiring and installation
E0045 (E45): Up/down forced Dec. switch disconnection	**Level 3**	Countmeasure
Fault reasons: Up/down forced Dec. switches simultaneously disconnected		1: Check whether up/down forced Dec. switches are normal 2: up/down forced Dec. signal characteristics (NO or NC) 3: F26.12 of Bit4 is set as 1
E0046 (E46): Re-leveling abnormal	**Level 3**	Countmeasure
Faulty subcode: 4600: No leveling signal and speed > 0.200m/s 4601: No leveling signal 4602: Speed > 0.200m/s	Fault reasons: 1: Elevator actual speed > re-leveling speed + 0.050m/s 2: Re-levelling position is not in the leveling area	1: Check the encoder signal 2: Check the leveling signal 3: Check the advanced open door block
E0047 (E47): Lock-door contactor adhesion	**Level 3**	Countmeasure
Faulty subcode: 4700: Door contactor feedback contact does not pick up 4701: Door contactor feedback contact sticking	Fault reasons: Lock-door contactor feedback signal abnormal	1: Check lock-door contactor feedback signal characteristics (NO or NC) 2: Check lock-door contactor action is normal or not 3: Check lock-door contactor feedback signal 4: Check the advanced open door block
E0048 (E48): OD fault	**Level 3**	Countmeasure
Faulty subcode: 4801: Front door opening failure 4802: Front door opening failure 4803: Door opening failure 4804: Door opening failure 4805: The door closing signal is detected after the front door is opened for 3s 4806: After the door is opened for 3s, the door closing signal is detected 4807: The car door switch is detected closed 3s after the front door is opened	4808: After the door is opened for 3s, the car door switch is detected to be closed 4809: After the front door is opened for 3s, the car door switch and the door closing signal are detected to be closed 4810: After the door is opened for 3s, the car door switch and the door closing signal are detected to be closed	1: Check the door motor system 2: Check the CTB is normal or not 3: Check the OD arrival signal is normal or not
Fault reasons: OD continuous non-arrival times are over F22.09		

E0049 (E49): CD fault		Level 3	Countmeasure
Faulty subcode: 4901 - 4907: Front door closing failure 4908 - 4912: Rear door closing failure	Fault reasons: CD continuous non-arrival times are over F22.09		1: Check the door motor system 2: Check the CTB is normal or not 3: Check the CD arrival signal is normal or not 4: Check the door lock circuit
E0050 (E50): Shaft self-learning fault		**Level 3**	Countmeasure
Faulty subcode: 5001: The upper limit is valid and the current floor is not the highest level 5002: Self-learning internal commands are missing 5003: Self-learning direction is down 5004: Forced to be invalid 5005: The current floor is not the first floor 5006: Current control mode is not closed loop vector control 5007: Forced invalid on the top floor 5008: Forced 1 learning height is 0 5009: Forced 1 learning height is 0 5010: Forced 2 learning height is 0 5011: Forced 2 learning height is 0 5012: Forced 3 learning height is 0 5013: Forced 3 learning height is 0 5014: Forced 2 position below lower forced 1 position 5015: Forced 2 position above upper forced 1 position 5016: Forced 3 position below lower forced 2 position 5017: Forced 3 position above upper forced 2 position 5018: The current floor is not top when forced 1 is active 5019: Flat keypad length is greater than 50cm 5020: Self-learning data overflow	5021: Self-learning data overflow 5022: Self-learning height is less than 50cm 5023: Lost maintenance command during self-learning 5024: Permanent magnet synchronous motor does not perform parameter auto-tuning 5025: The lower leveling layer is not separated from the leveling board 5026: Self-learning start upper limit is valid 5027: When the hoistway starts self-learning, the upper forced Dec. switch is effective. 5028: The lower forced Dec. switch distance is higher than the upper forced Dec. switch distance 5029: Forced Dec. switch adhesion 5030: Upper level switch sticking 5031: Lower leveling switch sticking 5032: When the floor is larger than 2 floors, the upper and lower leveling signals are invalid at startup. 5033: The upper and lower leveling switches are reversed 5034: Abnormal signal in the self-learning gate area of the hoistway		1: Check the up/down forced Dec. switch signal 2: Actual floor is consistent with present floor (F19.01) or not 3: Syn. motor is auto-tuning parameters or not 4: Check whether the motor actual running direction is correct 5: Check whether the leveling plate installation is correct 6: Check whether the leveling switch NO/NC setting is right 7: Check the up/down limit signal

<table>
<tr><td colspan="2">Fault reasons:
At the beginning of the learning, if any of the following conditions is met, the fault will be alarmed:
1. The present floor is not the first floor
2. The self-learning direction is not up running
3. Down forced signal is invalid
4. Initial angle of the Syn. motor is 0
5. The upper limint signal is valid
6. At two floors, the down leveling sensor isn't out off the leveling plate

Run to the second floor, if meet the following condition, alarm fault:
At the second floor self-learning, the learned adjustment distance is greater than 50cm</td><td>Run to the top floor, if meet any of following conditions, alarm fault:
1. Up forced Dec. 1 action is valid and in the door zone, and the present floor is inconsistent with the preset Max. floor
2. Elevator reaches the set floor and in the door zone, and the up forced Dec. 1 is no action
3. The learned height of total floor is lower than 50cm
4. The learned up/down forced Dec. 1 position is 0
5. If configured 2 and 3 level forced Dec. switches, the learned up and down forced Dec. position is 0
6. If you select multiple forced Dec. signal, if does not meet the following conditions, it will alarm fault:
• Down forced position 1 < Down forced position 2 < Down forced position 3
• Up forced position 1 > Up forced position 2 > Up forced position 3</td></tr>
<tr><td colspan="2">E0051 (E51): CAN communication fault</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td>Faulty subcode:
5101: CAN initialization hardware failure
5102: CAN communication failure</td><td colspan="2">Fault reasons:
CAN communication did not receive the correct data</td><td>1: Check the communication cable
2: Check the CTB power supply
3: Check the 24V power supply
4: Check D04.18 communication degree of interference
5: Check the matching resistor switch is valid or not</td></tr>
<tr><td colspan="2">E0052 (E52): Hall call communication fault</td><td>Level 3</td><td>Countmeasure</td></tr>
<tr><td>Faulty subcode:
5200: Calling communication failure
5201: IOB communication failure</td><td colspan="2">Fault reasons:
Hall call communication did not receive the correct data</td><td>1: Check the communication cable
2: Check the 24V power supply
3: Check whether the HCB address conflicts
4: Check D04.17 communication degree of interference</td></tr>
</table>

E0053 (E53): Lock-door short-circuit fault		Level 3	Countmeasure
Faulty subcode: 5301: Front door open door lock is shorted 5302: Rear door open door lock is shorted 5303: Front and rear door open door locks are shorted 5304: When the front door is opened, the door lock short 1 signal is detected 5305: After the front door is opened for 3s, it is detected that the door lock short 1 signal is valid 5306: When the rear door is opened, the door lock short circuit 2 signal is detected to be valid 5307: After the door is opened for 3s, the door lock short circuit 2 signal is detected to be valid	Fault reasons: OD arrival signal and lock door closure signal are valid at the same time		1: Check the door lock circuit action is normal or not 2: Check the door lock contactor feedback is normal or not 3: Check the door motor OD arrival signal 4: F26.12 (inspection parameter setting) of Bit3 is set as 1
E0054 (E54): Syn. motor star-delta contactor feedback abnormal		**Level 3**	Countmeasure
Faulty subcode: 5401: The contact contact of the star contactor does not pick up 5402: Seal contactor contact contact adhesion	Fault reasons: Syn. motor star-delta contactor feedback abnormal		1: Check whether the contactor feedback contact is consistent with MCB parameter setting (NO or NC) 2: Check whether the indicator on MCB output side is consistent with contactor action 3: After the contactor acts, check whether the corresponding feedback contact and MCB corresponding feedback input point acts 4: Check whether the output characteristics of contactor is consistent with that of MCB 5: Check the contactor coil circuit
E0055 (E55): Changed floor park fault		**Level 3**	Countmeasure
Fault reasons: When elevator runs automatically, the floor did not receive OD arrival signal			1: Check the door motor OD arrival signal 2: Check the door mechanical system

E0056 (E56): Run contactor feedback abnormal		Level 3	Countmeasure
Faulty subcode: 5601: Output contactor feedback contact does not pick up 5602: Output contactor feedback contact sticking	Fault reasons: Run contactor feedback abnormal or the door lock is broken when the run contactor is operated		1: Check whether the contactor feedback contact is consistent with MCB parameter setting (NO or NC) 2: Check whether the indicator on MCB output side is consistent with contactor action 3: After the contactor acts, check whether the corresponding feedback contact and MCB corresponding feedback input point acts 4: Check whether the output characteristics of contactor is consistent with that of MCB 5: Check the contactor coil circuit 6: F26.17 is set as 1, the fault will restore 7: F26.10 Bit6 is set to 1 to avoid E56 fault caused by the door lock being disconnected when the contactor is operated
E0057 (E57): Brake contactor feedback abnormal		**Level 3**	Countmeasure
Faulty subcode: 5701: Brake contactor feedback contact does not pull 5702: Brake contactor feedback contact sticking 5703: Brake trip switch does not open 5704: Brake trip switch is not closed 5705: Brake force contactor feedback contact does not pull 5706: Brake strong contactor feedback contact adhesion 5707: Brake switch 2 does not open 5708: Brake trip switch 2 is not closed	Fault reasons: 1: Brake contactor feedback signal abnormal 2: Brake mechanical switch feedback abnormal 3: Brake forced feedback abnormal		1: Check whether the contactor feedback contact is consistent with MCB parameter setting (NO or NC) 2: Check whether the indicator on MCB output side is consistent with contactor action 3: After the contactor acts, check whether the corresponding feedback contact and MCB corresponding feedback input point acts 4: Check whether the output characteristics of contactor is consistent with that of MCB 5: Check the contactor coil circuit 6: Check the brake mechanical switch feedback signal 7: Check the brake forced feedback signal 8: Check the brake forced contactor coil 9: F26.17 is set as 1, the fault will restore

E0058 (E58): Leveling signal abnormal	Level 3	Countmeasure
Faulty subcode: 5801: Door area signal bonding 5802: Door signal disconnected 5803: Upper level signal adhesion 5804: Upper level signal is disconnected 5805: Lower level signal adhesion 5806: Lower leveling signal is disconnected	Fault reasons: Leveling/door zone signal is adhesion or cut off	1: Check whether the leveling and the door zone can work normally 2: Check the vertical and depth of leveling plate installation 3: Check the MCB input point
E0059 (E59): Receive OD and CD arrival signals at the same time	**Level 3**	Countmeasure
Faulty subcode: 5901: The front door switch door is in place at the same time 5902: The rear door switch door is in place at the same time	Fault reasons: Receive door motor OD and CD arrival signals at the same time	1: Check the door motor controller 2: Check OD/CD arrival signal characteristics (NO or NC) 3: At inspection mode, F26.12 (inspection parameter setting) of Bit5 is set as 1, which can shield the fault
E0060 (E60): Forced Dec. distance is too short	**Level 3**	Countmeasure
Faulty subcode: 6001: The upper and lower forcing distance is too short 6002: The lower forcing distance is too short 6003: The upper forced distance is too short	Fault reasons: Forced Dec. distance is too short	1: Check up/down forced Dec. 1 switch installation 2: Check the forced Dec. speed (F03.12)
E0061 (E61): Parallel group control communication abnormal	**Level 3**	Countmeasure
Faulty subcode: 6101: CAN hardware error 6102: CAN disconnection	Fault reasons: CAN communication did not receive the correct data	1: Check the communication cable 2: Check the parallel parameter setting 3: Check D04.19 communication degree of interference
E0062 (E62): Inspection run overcurrent	**Level 3**	Countmeasure
Fault reasons: Inspection running current is 110% over motor rated current		1: Reduce the load 2: F26.12 of Bit1 is set as zero 3: Syn. motor identified the encoder angle does not match with the actual, restart parameter auto-tuning 4: Encoder abnormal 5: Brake circuit abnormal
E0063 (E63): Advanced open door abnormal	**Level 3**	Countmeasure
Fault reasons: 1: Speed is larger than advanced open speed + 0.050m/s 2: Advanced open operation is not in the leveling		1: Check the encoder signal 2: Check the leveling signal 3: Check the advanced open block (NL3000-AOB-A)

E0064 (E64): Car sliping accidence		Level 3	Countmeasure
Faulty subcode: 6400: Car illegal movement failure 6401: Elevator roll is detected during elevator stop	Fault reasons: The elevator stop state detects that the elevator position changes more than 5CM		1: Check the brake 2: Check the encoder 3: Check the balance factor 4: Check the load 5: F27.28 Bit15 is set to 1 to shield the fault
E0065 (E65): UCMP fault		**Level 3**	Countmeasure
Faulty subcode: 6500: UCMP test failure 6501: UCMP protection failure 6502: UCM contactor feedback error (no feedback) 6503: UCM contactor feedback error (with feedback) 6504: Abnormal brake feedback switch detected when stopping the elevator 6505: Abnormal brake feedback switch detected during operation	Fault reasons: 1: When sealed contactor outputs, door area singal is detected from valid to invalid and door lock signal is disconnected, The elevator reports the E65 fault, the elevator stops running, and sealed contactor stops output 2: When the controller is in the stop state, it detects that the door area signal is changed into invalid and the door lock signal is disconnected at the same time, and it is judged that any layer signal is invalid, the elevator reported E65 fault, the elevator stops running 6504: When the elevator is stopped, the brake mechanical feedback switch is detected abnormally, and the E57 fault is reset up to three times, and the E65 fault is reported for the fourth time 6505: The brake mechanical feedback switch is detected abnormally during operation, and the E57 fault is reset up to three times, and the E65 fault is reported for the fourth time		1: Check whether the brake is abnormal 2: Check the door signal and level signal 3: Check if the elevator brake mechanical feedback switch is abnormal
E0066 (E66): Brake force auto-checking fault		**Level 3**	Countmeasure
Faulty subcode: 6600: Too much pulse movement or excessive detection speed during brake braking force test 6601: Sine-cosine encoder CD phase displacement is too large during brake braking force test	Fault reasons: 1: during brake force detection process, pulse exceeds the set value F04.16 2: during brake force detection process, detection speed is more than 0.50m/s		1: Check whether the brake is abnormal

E0067 (E67): Speed regulator feedback abnormal		**Level 3**	Countmeasure
Faulty subcode: 6701: Speed limiter contactor feedback contact does not pull 6702: Speed limiter contactor feedback contact sticking	Fault reasons: Speed regulator feedback abnormal		1: Check the contactor feedback setting is the same with the MCB board (NO, NC) 2: Check the MCB board output indicator and contactor action to ensure consistency 3: Check the contactor action, confirm the corresponding feedback contact has action, the MCB board corresponding to the feedback input point action 4: Check the contactor and the MCB board output characteristics, to confirm the same 5: Check the contactor coil circuit
E0068 (E68): CIC-B communicaiton abnormal		**Level 3**	Countmeasure
Faulty subcode: 6801: CIC-B communicates abnormally with the motherboard. 6802: CIC-B itself is faulty	Fault reasons: The elevator MCB board communicates with CIC-B abnormally		1: Check the MCB board and CIC-B communication wire 2: Check the CIC-B internal mobile phone card communication is normal
E0069 (E69): Wrong logic		**Level 2**	Countmeasure
Fault reasons: Wrong logic			1: Return to factory
E0070 (E70): Bottom pit water failure		**Level 2**	Countmeasure
Fault reasons: The control system detects that the bottom hole water protection signal is valid			1: Check the bottom pit inlet switch 2: Check group F12 bottom pit water signal NO or NC setting
E0071 (E71): Over-load switch fault		**Level 1**	Countmeasure
Fault reasons: When Elevator zero speed start operation detection current exceeds F02.07, overload switch is not action			1: Check overload switch 2: Check if the F02.07 is set correctly
E0072 (E72): Car illegal movement failure		**Level 3**	Countmeasure
Fault reasons: Elevator parking process summary to detect illegal movement of the car			1: Check the brake condition 2: Adjust the parking sequence (make sure the elevator stops during the parking process)
E0073 (E73): Forbiden fast car alarm		**Level 4**	Countmeasure
Fault reasons: 1: There is fast running forbidden at multi-function input terminal 2: There is bypass input signal at multi-function input terminal			Check the external signal

E0074 (E74): Internal fault		**Level 3**	Countmeasure
Faulty subcode: 7400: Parameter auto-tuning is prohibited 7401: Prohibition of self-learning failure of the well 7402: Rotating auto-tuning is prohibited 7403: Aauto-tuning with load is prohibited	Fault reasons: 1: Parameter auto tuning can not be performed 2: Can not be shaft self-learning		Contact the elevator factory, the agent
E0075 (E75): External energy feedback fault		**Level 3**	Countmeasure
Fault reasons: External energy feedback fault input terminal signal detected			Check if the MCB board input signal and the external energy feedback device are in a fault state
E0076 (E76): External UPS failure		**Level 4**	Countmeasure
Fault reasons: External UPS fault input terminal signal detected			Check the MCB board input signal and whether the external UPS unit is in a fault state
E0077 (E77): EIO communication failure		**Level 3**	Countmeasure
Faulty subcode: 7700: EIO start communication failure 7701: EIO has output communication failure	Fault reasons: The motherboard and EIO communication are abnormal		Check wiring
E0078 (E78): Clock chip failure		**Level 3**	Countmeasure
Fault reasons: Clock chip read time range is out of limits			1: Check external battery signal 2: Reset time parameters 3: Replace the motherboard
E0079 (E79): External seismic signal failure		**Level 4**	Countmeasure
Fault reasons: External seismic input terminal signal detected			Check if the external seismic signal is normal

9.1.2 Reset Fault

After the fault is removed, reset NL3000 by any of the following methods:

- Press STOP (keypad) to reset.
- Make NL3000 completely power down.
- Some faults may auto-reset, see the table below:

Table 9-2 Automatic reset fault

Faults		Reset Conditions
E0009	Heatsink overheated fault	After the heatsink temperature drops to 50℃, the fault will reset automatically
E0020	Motor overheated fault	After motor overheated switch recovers, the fault will reset automatically.
E0041	Safety circuit disconnection fault	After the safety circuit is connected, the fault will reset automatically
E0042	Door locked disconnection fault	After locked-door is connected and auto reset, or door zone signal is valid, 1s later, the fault will reset automatically
E0051	Car top CAN communication fault	The fault only recorded once at power up and after communication resumes, the fault will reset automatically
E0052	Hall call Modbus communication fault	The fault only recorded once at power up and after communication resumes, the fault will reset automatically
E0055	Changed floor park fault	The fault only recorded once at power up
E0059	OD and CD arrival signals at the same time fault	The fault only recorded once at power up, and if OD/CD arrival signals are not valid at the same time, the fault will reset automatically
E0061	Parallel group control communication abnormal	The fault only recorded once at power up and after communication resumes, the fault will reset automatically
E0048, E0049, E0055		Can be reset by inspection button
E0001, E0002, E0003, E0008, E0017, E0030, E0031		In order to protect the internal device of the controller, the fault reset needs to be delayed for a period of time
E0070, E0071, E0073		Can be reset automatically

9.2 Maintenance

Many factors such as ambient temperature, humidity, dust, oscillation, internal component aging, wear and tear will give rise to the occurrence of NL3000 potential faults. Therefore, it is necessary to conduct daily maintenance to NL3000.

- If NL3000 has been transported for a long distance, please check whether the components are complete and the screws are well tightened.
- Please periodically clean the dust inside NL3000 and check whether the screws are loose.

Danger

- Only a trained and qualified professional person can maintain NL3000.
- Maintenance personnel should take off all metal jewellery before carrying out maintenance or internal measurements. Suitable clothes and tools must be used.
- High voltage exists when NL3000 is powered up or running.
- Checking and maintaining can only be done after NL3000 AC power is cut off and wait for at least 10 minutes. The cover maintenance can only be done after ensured that the charge indicator inside NL3000 are off and the voltage between power terminals (+) and (-) is below 36V.

Warning

- For NL3000 stored for more than 2 years, please use voltage regulator to increase the input voltage gradually.
- Do not leave metal parts like screws or pads inside NL3000
- Do not make any change to the NL3000 inside without instruction from the supplier.
- There are IC components inside the NL3000, which are sensitive to static electricity. Directly touch the components on the PCB board is forbidden.

Daily Maintenance

NL3000 must be operated in the specified environment (refer to section 5.1, page 46). Besides, some unexpected accidents may occur during operation, and you should check the items in accordance with Table 9-3 to do well daily maintenance.

Maintain good operation condition and record the operation data to solve problems immediately.

Table 9-3 Daily checking items

Items	Content	Criteria
Operating environment	Temperature and humidity	-10 - +40℃, derating at 40 - 50℃
	Dust and water dripping	No water dripping
	Gas	No strange smell
NL3000	Oscillation and heating	Stable oscillation and proper temperature
	Noise	No abnormal sound
Motor	Heating	No overheating
	Noise	No abnormal sound
Operating state parameters	Output current	Within rated range
	Output voltage	Within rated range

Periodical Maintenance

Customer should check NL3000 in short time or every 3 to 6 months according to the actual environment so as to avoid hidden problems and make sure NL3000 runs well for a long time.

General check:

- Check whether the screws of control terminals are loose. If so, tighten them with a screw driver.
- Check whether the main circuit terminals are properly connected. whether the mains cables are over heated.
- Check whether the power cables and control cables are damaged, check especially for any wear on the cable tube.
- Check whether the insulating tapes around the cable lugs are stripped, and for signs of overheating near terminations.
- Clean the dust on PCBs and air ducts with a vacuum cleaner.

Note:

1. Dielectric strength test of NL3000 has already been conducted in the factory. Do not do the test again. Otherwise, NL3000 might be damaged.

2. If insulation test to the motor is necessary, it should be done after the motor's input terminals U/V/W have been detached from NL3000. Otherwise, NL3000 will be damaged.

3. For NL3000 that have been stored for a long time, they must be powered up every 2 years. When supplying AC power to NL3000, use a voltage regulator to gradually raise the input voltage to rated input voltage at least 5 hours.

Replacing Damaged Parts

The components that are easily damaged are: cooling fan and electrolytic capacitors of filters. Their lifetime depends largely on their application environment and preservation. The users can decide the time when the components should be replaced according to their service time.

Easily Damaged	Cooling fan	Electrolytic capacitors
Life	60, 000 hours	50, 000 hours
Possible Cause of Damages	Wear of the bearing, aging of the fan vanes	High ambient temperature, aging of electrolyte and large pulse current induced by rapid changing loads
Criteria	After NL3000 is switched off, check if the abnormal conditions such as crack existing on fan vanes and other parts. When NL3000 is switched on, check if NL3000 running is normal and check if there is any abnormal oscillation.	Check if frequent overcurrent or overvoltage failures occur during NL3000 start-up with load. Check if there is any leakage of liquids. Check if the safety valve protrudes. Measure the static capacitance and insulation resistance.

Scrap Disposition

When scrapping, please note:

- NL3000 internal electrolytic capacitor incineration may cause an explosion.
- Plastic parts will produce toxic gases when burned. Please treat it as industrial waste.

NAQSH-E-LASANI
ELECTRONICS

NEL
INNOVATION MATTERS
ELECTRONICS

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