涌现集团
YONGXIAN GROUP

NICE3000new Series Integrated Elevator Controller

User Manual

Version 202501

Preface

Thank you for purchasing the NICE3000^{new} integrated elevator controller.

The NICE3000^{new} is a new-generation integrated elevator controller independently developed and manufactured by Inovance Technology, by optimizing the NICE3000 controller based on a large number of applications and combining new industrial features. Monarch is a proprietary elevator product brand of Inovance.

The NICE3000^{new} has the following major features:

1 More advanced technology

The NICE3000^{new} integrated elevator controller is a world-leading intelligent control system that integrates computer, automatic control, network communication, and motor vector drive technologies:

- Distance-based direct travel ride, N curves generated automatically
- Group control algorithm of less than eight elevators based on the fuzzy control theory
- Multi-CPU redundancy control and integration of advanced CANbus, Modbus, and Internet of Things communication technologies
- Built-in real-time clock, which provides time-based services, facilitating intelligent floor service management
- Flexible emergency rescue running scheme
- Automatic identification running of short floor
- Unintended car movement protection (UCMP) and braking force detection function

2 Easier use

- Integration of control and drive and compact structure, requiring only a small equipment room or even no equipment room
- Easy functional parameter design, making commissioning convenient
- Considerate keypad design, making inspection, maintenance and commissioning of the elevator easy
- Any weight that allows load cell auto-tuning
- Multiple commissioning tools, including PC host computer software, operation panel, and cell phone
- Elevator experience function: automatic detection on balance coefficient and test on slip amount

3 Safer running

- Multiple security protections, compliant with the GB7588-2003 standard
- Fault tolerant design of hardware and software; multi-class fault processing; minimization of accidents including over travel bottom terminal and over travel top terminal to ensure safe running
- Professional drive manufacturing technology and strong environmental adaptability; full resistance to power grid fluctuation, dust, high temperature, and

thunder.

- Two-chip controlled running and brake, STO function

4 More comfortable riding

- No-load-cell technology or special load cell compensation device, providing near-perfect startup compensation
- High-performance vector control, achieving good motor performance and riding comfort

5 Better economy

- Integration of drive and control, which makes system configuration simpler, reduces peripheral wiring and the cost, and improves elevator safety and stability
- Use of CANbus and Modbus communication, reducing the quantity of traveling cables
- Flexible modular optional parts
- Parallel connection easily implemented using two wires, without configuring any extra group control board

§ About This Manual

This manual describes the correct use of the NICE3000^{new}, including product features, safety information and precautions, design, installation, operation & maintenance, and troubleshooting guide. Read and understand the manual before using the product, and keep it carefully for reference to future maintenance.

Latest Use Information

Email: UM@inovance.cn

Website: http://www.inovance.cn

§ Legal Information

- Warning Notice

Read this manual thoroughly before using the product.

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. Inovance will assume no liability or responsibility for any injury or loss caused by improper operation.

- Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel have received full safety and product use training and have related experience.

- Disclaimer of Liability

We have reviewed the contents of this manual to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency.

The instructions are subject to change, without notice, due to product upgrade, specification modification as well as efforts to increase the accuracy and convenience of the manual.

The drawings in the manual are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the manual.

The drawings in the manual are for typical applications and may not match your actual application.

■ Copyright

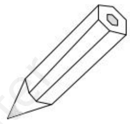
§ Approvals

CE marks on the NICE3000^{new} controller indicate that this controller complies with EU LVD and EMC directives and is CE certified.

Directive	Directive Name	Approvals
EMC directives	2014/30/EU	EN12015:2014 EN12016:2013
LVD directives	2014/35/EU	EN61800-5-1

Memo NO. __________

Date　/　/



Introduction

1 Basic functions

Function	Description	Remarks
Common Running Functions		
Full collective selective	In automatic running or attendant state, this function enables the elevator to respond both car calls and hall calls. Passengers at any service floor can call the elevator by pressing the up call button and down call button.	FE-00 "Collective selective mode"
Service floor	The standard program supports 40 floors. The service of more than 40 floors is supported by the customized program.	-
Door open time setting	The system automatically determines different door open time for door open for call, command, protection, or delay according to the set door open holding time.	Set in group FB
Door open holding	In automatic running state, passengers can press the door open holding button in the car to delay door open to facilitate goods to be moved in or out.	FB-14 "Door open holding time"
Door machine service floor setting	You can set the required service floors of the door machines.	FB-02/03/04/05 FB-18/19
Door pre-close by the door close button	During door open holding in automatic running state, passengers can press the door close button to close the door in advance, which improves the efficiency.	-
Floor number display setting	The system supports display of floor numbers in combinations of numbers and letters, which meets the requirements of special conditions.	Set in group FE
Light curtain signal judgment	If the door is blocked by stuff during door close, the light curtain acts and the elevator opens the door. This function is invalid in fire emergency state.	-
Auxiliary operation box	An optional auxiliary operation box that has the same functions as the main operation box is available.	-
Independent control of the front door and back door	When there are two doors for a car, automatic control on the two doors depends on your requirements.	-
Repeat door close	If the door lock is not applied after the elevator performs door close for a certain time, the elevator automatically opens the door and then closes the door again.	FB-08 "Door close protection time"
Independent command	When the main and auxiliary operation boxes are configured, the auxiliary operation box can be set to the back door or disability command input. They independently control door open/close according to the commands in automatic running state.	-
Voice announcement	The elevator automatically announces information such as the running direction and next arriving floor during running.	This function requires use of the MCTC-CHM.
Auto-leveling	The system implements automatic accurate leveling based on the floor pulse counting and up/down leveling feedback signals.	-
Response at acceleration	The system allows the elevator to automatically respond to calls from the service floors during acceleration.	-

Function	Description	Remarks
Down collective selective control	In automatic running or attendant state, the elevator responds only to hall down calls besides car calls.	-
Idle elevator returning to base floor	In automatic running state, the elevator automatically returns to the set parking floor and waits for passengers if there is no car call or hall call within the set time.	F9-00 "Idle time before returning to base floor"
Landing at another floor	If the door open time exceeds the door open protection time but the door open limit signal is still inactive, the elevator closes the door and then automatically runs to the next landing floor; the system reports fault Err55.	-
Forced door close	When the door fails to close within the set time due to the action of the light curtain or safety edge, the elevator enters the forced door close state, closes the door slowly, and gives a prompt tone.	-
Cancellation of wrong calls	Passengers can press the button consecutively twice to cancel wrong calls.	-
Service floor setting	You can enable or disable the system service for certain floors flexibly based on actual requirements.	F6-05/06/35
Independent running	The elevator does not respond to any call, and the door needs to be closed manually. In the case of group control, the elevator runs independently out of the group control system.	Signal input: CCB JP23
Attendant running	In attendant state, the running of the elevator is controlled by the attendant.	Signal input: CCB JP21
Low-speed self-rescue	When the elevator is in non-inspection state and stops at non-leveling area, the elevator automatically runs to the leveling area at low speed if the safety requirements are met, and then opens the door.	-
Door control function	You can set whether the system keeps outputting commands after door open limit and door close limit based on the type of the door machine.	-
Car arrival gong	After the elevator arrives at the destination floor, the CTB gives a prompt tone.	-
Hall arrival forecast indicator	When the elevator will arrive at the destination floor soon, the hall arrival forecast indicator becomes ON.	HCB product output
Hall arrival gong	When the elevator will arrive at the destination floor soon, the hall arrival gong becomes ON.	HCB product output
Hall I/O extension function	If the hall I/O terminals are not sufficient, more terminals can be provided by using MCTC-KZ-G1.	-
Car I/O extension function	If the car I/O terminals are not sufficient, more terminals can be provided by using MCTC-KZ-G1.	-
Button stuck check	The system can automatically identify whether a hall call button is stuck and cancel the stuck call, preventing the condition that the elevator cannot close and run due to stuck hall calls.	Bit4 of FE-32
Automatic startup torque compensation	The system automatically implements startup torque compensation based on the current car load, achieving smooth startup and improving the riding comfort.	F8-01 "Pre-torque selection"
Direct travel ride	The system automatically calculates and generates the running curves based on the distance, enabling the elevator to directly stop at the leveling position without creeping.	-
Automatic generation of optimum curve	The system automatically calculates the optimum speed curve compliant with the human-machine function principle based on the distance, without being limited by the number of curves or short floor.	-

Function	Description	Remarks
Service suspension output	When the elevator cannot respond to hall calls, the corresponding terminal outputs the service suspension signal.	-
Running times recording	In automatic running state, the system automatically records the running times of the elevator.	Recorded in F9-11/12
Running time recording	The system automatically records the accumulative working hours and working days of the elevator.	Recorded in F9-09
Automatic door open upon door lock abnormality	If the system detects that the door lock circuit is abnormal during door open/close, the elevator automatically opens and closes the door again, and reports a fault after the set door open/close times is reached.	FB-09 "Door open/close times"
VIP service	The elevator first directly runs to the VIP floor and provides services for special persons.	-
Disability service	When the elevator is waiting at the leveling position, if there is a call at this floor from the disability operation box, the door open holding time is prolonged. It is the same for the back door.	FB-15 "Special door open holding time"
Full-load direct running	When the car is full-loaded in automatic running state, the elevator does not respond to hall calls from the passing floors. These halls calls, however, can still be registered, and will be executed at next time of running (in the case of single elevator) or by another elevator (in the case of parallel/group control).	-
Overload protection	When the car load exceeds the rated elevator load (Overload condition: When the car load exceeds 110% of the rated load, the elevator enters the overload state), the elevator gives an alarm and stops running without door close.	-
Fault data recording	The system automatically records detailed information of faults, which helps improve the efficiency of maintenance and repair.	Groups FC and E0 to E9
Inspection-related Functions		
Simple maintenance keypad	The 3-button keypad on the MCB provides the functions such as commissioning the running floors and door open/close.	-
Operation box commissioning	The hand-held manipulator can be connected to the system in the car for elevator commissioning, which improves the commissioning efficiency.	-
Shaft auto-tuning	Shaft auto-tuning is required before first-time automatic running. The elevator runs from the bottom floor to the top floor at the inspection speed and automatically records all position signals in the shaft in the running process.	F1-11 "Auto-tuning mode"
User-defined parameter display	You can view the parameters that are modified and different from the default setting.	FP-02
Inspection running	After entering the inspection state, the system cancels automatic running and related operations. You can press the up or down call button to make the elevator jog at the inspection speed.	-
Emergency motor-operated running	After entering the emergency motor-operated running state, the system cancels automatic running and related operations. You can press the up or down call button to make the elevator jog at the emergency motor-operated speed.	Refer to the description of parameters in group F5
Motor auto-tuning	With simple parameter setting, the system can obtain the motor parameters no matter whether the motor is with-load or without load.	-

Function	Description	Remarks
Floor position intelligent correction	Every time the elevator runs to the terminal floor, the system automatically checks and corrects the car position information based on slow-down switch 1, and eliminates over travel top terminal or bottom terminal with use of the slow-down switches.	-
Dual-speed for inspection	Considering inaccurate running control at high inspection speed but long running time at low inspection speed, the system provides the dual-speed curve for inspection, which greatly improves the efficiency at inspection.	-
Test running	The test running includes the fatigue test of a new elevator, car call floor test, hall call test, and tests such as hall call response forbidden, door open/close forbidden, terminal floor limit switch shielded, and overload signal shielded.	-
Fire Emergency and Security Functions		
Returning to base floor at fire emergency	After receiving a fire emergency signal, the elevator does not respond to any call but directly runs to the fire emergency floor and waits.	F6-03 and F8-12 "Fire emergency floor"
Firefighter operation	After the elevator enters the firefighter running mode, door open/close is implemented by the jog operation (optional) by using the door open and close buttons rather than automatically. In addition, the elevator responds to only car calls and only one call can be registered once.	F6-44
Security floor	After the security floor function is enabled, the security floor is used at 10:00 p.m. to 6:00 a.m, and the elevator runs to the security floor first every time, stops and opens the door, and then runs to the destination floor.	F6-13
Elevator lock	In automatic running state, when the elevator lock switch acts or the set elevator time is reached, the elevator returns to the elevator lock floor after responding to all car calls, stops running, and turns off the lamp and fan in the car.	F6-04 "Elevator lock floor"
Troubleshooting based on fault level	Faults are classified into different levels based on the severity. Different levels of faults are rectified using different methods, improving the system operation efficiency.	-
Runaway prevention	The system detects the running state of the elevator in real time. If the elevator speed exceeds the limit, the system immediately stops running of the elevator.	-
Automatic identification of power failure	The system automatically identifies power failure and outputs the relay signal for emergency evacuation automatic switchover to implement emergency evacuation at power failure.	Y6 especially used for emergency evacuation switchover
Automatic running mode switchover at power failure	For the synchronous motor, when the power supply is interrupted, the system can perform automatic switchover between shorting stator braking mode and controller drive mode, implementing quick and stable self-rescue. Shorting stator braking mode: Upon power failure, UPS is used, the motor stator is shorted, and the brake is automatically released, making the car move slowly under the effect of the weighing difference between the car and the counterweight.	F6-45 "Emergency evacuation function selection"
Running direction self-identification at power failure	When the power supply is interrupted, the system can automatically identify the current car load and determine the running direction.	F6-45 "Emergency evacuation function selection"
Base floor verification	After detecting a position abnormality, the system runs the elevator to each floor until reaching the terminal floor for verification, guaranteeing system security.	-

Function	Description	Remarks
Passenger unloading first upon fault	The system automatically determines the fault level. If the safety running conditions are met, the elevator first runs to the leveling position to unload passengers.	-
Interference degree judgment	The system judges the degree of communication interference.	Viewed in FA-24
Earthquake protection	When the earthquake detection device acts and inputs a signal to the system, the elevator lands at the nearest floor and stops running. After the earthquake signal becomes inactive and the fault is reset manually, the elevator restores to normal running.	-
Current cancellation in ramp mode	For the PMSM, after the elevator decelerates to stop, the holding current of the motor is canceled in ramp mode, preventing abnormal noise during current cancellation.	F2-17
Independent working power supply	The NICE3000^{new} system supports not only three-phase 380 VAC but also single-phase 220 VAC to meet different applications of the power supply system (such as 220 V UPS)	-
Automatic voltage identification	The system detects the bus voltage and automatically adjusts the running speed of the elevator to adapt to the situation of insufficient power from power supply (such as emergency UPS).	-
Parallel/Group Control and Other Functions		
Parallel/Group control	The system supports parallel/group control of two elevators and provides multiple scheduling algorithms to meet requirements of different customers.	-
Dispersed waiting	In parallel/group control, the elevators can wait at different floors.	F6-09
Parallel/Group control exit	If the parallel/group control exit switch of a certain elevator in a parallel/group control system is valid or the time for exiting the parallel/group control is reached, the elevator exits parallel/group control and runs independently. This does not affect normal running of the parallel/group control system.	-
Parallel/Group control automatic exit	If an elevator in the parallel/group control system cannot respond to calls in time due to faults, the elevator automatically exits the parallel/group control system and runs independently. This does not affect normal running of the parallel/group control system.	-
Anti-nuisance function	The system automatically judges the number of passengers inside the car and car call registers. If there are excessive car calls, the system determines that it is in nuisance state, and cancels all car calls. Then, car calls need to be registered again correctly.	F8-08 "Anti-nuisance function"
Prompt of non-door zone stop	The system gives a prompt when the elevator stops at a non-door zone area due to faults.	-
Full-load indication	When the elevator is full-loaded, a full-load indication is displayed on the HCBs and the elevator directly runs to the desired floors.	-

Function	Description	Remarks
Energy-saving Functions		
Car energy-saving	In car door open holding and door close limit state, after the set time (F9-01) passes by, the system automatically cuts off the power supply to the lamp and fan in the car.	F9-01 "Time for fan and lamp to be turned off"
Energy-saving running with standby power supply	When the normal power supply is interrupted and the emergency power supply is used, the system reduces the running speed of the elevator in the prerequisite of guaranteeing the smooth running curve.	-
Arrival gong disabled at night	Within the set time period, the arrival gong is disabled.	Bit4 of F5-33

2 Optional functions

Function	Function description	Remarks
Door pre-open function	In automatic running state, when the elevator speed is smaller than 0.25 m/s and the door zone signal is active, the system shorts the door lock by means of the shorting door lock circuit relay and outputs the door open signal, implementing door pre-open. This improves the elevator use efficiency.	MCTC-SCB required
Micro-leveling	After landing at a floor, the elevator may move upward or downward due to the load change and the car door is not aligned with the ground, which is inconvenient for passengers and goods in and out. In this case, the system allows the elevator to run to the leveling position in the door open state at the re-leveling speed.	MCTC-SCB required
Power failure emergency evacuation	For the elevator configured with emergency power supply, the system uses the emergency power supply to implement low-speed self-rescue in the case of power failure.	MCTC-ARD-C required
Onsite commissioning Function	The system can control and monitor running of elevators by using the NEMS software.	-
Commissioning by cell phone	The smartphone can be connected to the controller through the external WIFI module, and you can commission the elevator, and upload and download parameters by using the cell phone.	Special WIFI module and cell phone host computer required
Residential monitoring	The control system can be connected to the terminal in the monitoring room. By using the NEMS software, you can view the floor position, running direction, and fault state of the elevator.	NEMS software, accessories, and MCTC-MIB required
IC card	Passengers need to use the IC card to go to floors that require authorization.	IC card required
STO	When a fault is detected in the safety circuit, the STO function safety card acts immediately to cut off the output current of the controller and stop the output torque of the motor.	Special bottom and STO function card MCTC-JCB-A2 required
Machine-room-less monitoring	The running state of the elevator inside the shaft is displayed and the function of commissioning and burning outside the shaft is implemented through the MCTC-MB-A2 monitoring board.	MCTC-MB-A2 monitoring board required

Contents

Safety Instructions

Safety Disclaimer

- Read and comply with the safety instructions before you performing any installation, operation, and maintenance on the equipment.
- To ensure the safety of humans and the device, follow the marks on the device and all the safety instructions in this document.
- The "CAUTION", "WARNING", and "DANGER" are only supplements to the safety instructions.
- Use this equipment based on the designated environment requirements. Damages caused by improper usage are not covered by warranty.
- The company shall take no responsibility of any personal injuries or property damages caused by improper usage.

Safety Levels and Definitions

The ⚠ Danger "Danger" sign indicates that failure to comply with the notice will result in server personal injuries or even death.

The ⚠ Warning "Warning" sign indicates that failure to comply with the notice may result in server personal injuries or even death.

The ⚠ Caution "Caution" sign indicates that failure to comply with the notice may result in minor or moderate personal injuries or damage to the equipment.

Safety Instructions

Unpacking
⚠ Caution ◆ Check whether the packing is intact and whether there is damage, water seepage, damp, and deformation. ◆ Unpack the package following the package sequence. Do not hit the package with force. ◆ Check whether there are damages, rust, or injuries on the surface of the product or product accessories. ◆ Check whether the number of packing materials is consistent with the packing list.

Warning

- Do not install the equipment if you find damages, corrosions, or indications of use on the product or accessories.
- Do not install the equipment if you find water seepage, component missing or damage upon unpacking.
- Do not install the equipment if you find the packing list does not conform to the equipment you received.

Storage and Transportation

Caution

- Store this equipment based on the storage and transportation requirements on humidity and temperature.
- Avoid transporting the equipment in environment such as water splashing, rain, direct sunlight, high voltage, strong magnetic field, and strong vibration.
- Avoid storing the product for more than 3 months, long-term storage shall require stricter protection and necessary inspections..
- Pack the product strictly before you transport. Use a sealed box for long-distance transportation.
- Never transport this product with products or materials that harm or have negative impacts on this product.

Warning

- Use professional loading and unloading equipment to carry large-scale or heavy products.
- When carry this equipment with bear hand, hold the product casing firmly with care preventing from parts falling, otherwise, it may result in personal jury or equipment damages.
- Handle the products with care, mind your steps, otherwise, it may result in personal juries or equipment damages.
- Never stand or stay below the equipment when the equipment is lifted by hoisting equipment.

Installation

Warning

- Read and comply with the safety instructions before performing installation.
- Do not modify this product.
- Do not rotate the product components or the fixed bolts and red marked bolts on product components.
- Do not install this product in places where there is strong electric field or strong magnetic field.
- When this product is installed in a cabinet or terminal device, the cabinet or terminal device must be equipped with protective shell. The proof class must comply with relevant IEC standards and local regulations.

⚠ Danger ◆ Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement. ◆ The installation, wiring, maintenance, inspection and parts replacement are intended to be performed by professional personnel only. ◆ Installation personnel must be familiar with product installation requirements and relevant technical materials. ◆ If you need to install transformer or other strong electromagnetic interference equipment, install shielding device at the same time to avoid product malfunction.
Wiring
⚠ Danger ◆ Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement. ◆ Never perform wiring at power-on. Failure to comply may result in electric shock. ◆ Cut off all power supplies before wiring. Wait at least 10 minutes after power-off so that residual voltage can discharge safely. Wait at least 10 minutes after power-off so that residual voltage can discharge safely. ◆ Make sure that the equipment is reliably grounded. Failure to comply may result in electric shock. ◆ Following the proper electrostatic discharge (ESD) procedures, and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or the internal circuit the product.
⚠ Warning ◆ Never connect the power cable with the product output terminals (U, V, W.). Failure to comply may result in equipment damage or even fire. ◆ When connecting driving equipment with the motor, make sure the phase sequence of the drive and motor are consistent to prevent motor reverse rotation. ◆ The cable used in wiring must conform to the wire diameter and shielding requirements, the shielding layer of the shielded cable must be reliably grounded at one end. ◆ After wiring, make sure there are no fallen screws or exposed wire inside the cabinet or product.
Power-on
⚠ Danger ◆ Before power-on, make sure that the equipment or products are intact, all wiring are safely connected, and the motor device allows a restart. ◆ Before power-on, check if the power supply meets the equipment requirements, avoid equipment damage or fire. ◆ At power-on, equipment or product may start running abruptly, keep away from mechanical device. ◆ After power-on, never open the cabinet door or the protective shell to avoid electric shock. ◆ Never touch any terminals at power-on to avoid electric shock. ◆ Never dismantle the equipment or remove any parts from the equipment at power-on to avoid electric shock.

Operation
⚠ Danger ◆ Never touch any terminals during operation. Failure to comply may result in electric shock. ◆ Never dismantle the equipment or remove any parts from the equipment during operation. Failure to comply may result in electric shock. ◆ Never touch the equipment shell, fan or resistor for temperature detection. Failure to comply may result in burn! ◆ Do not allow non-professional technicians to detect signals during operation. Failure to comply may result in equipment damage even personal injuries.
⚠ Warning ◆ Prevent metal or other objects from falling into the device during operation, failure to comply may result in equipment damage. ◆ Never use contactors to start or stop the equipment. Failure to comply may result in damage to the equipment!
Maintenance
⚠ Danger ◆ Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement. ◆ Never perform maintenance at power-on. Failure to comply may result in electric shock. ◆ Before maintenance, wait at least 10 minutes after power-off so that residual voltage can discharge safely.
⚠ Warning ◆ Following the equipment repair and maintenance requirements to perform routine and periodical inspection and maintenance, and keep a maintenance record.
Repair
⚠ Danger ◆ Do not allow non-professionals to perform product installation, wiring, maintenance, inspection or parts replacement. ◆ Never perform any inspection or maintenance operations at power-on. Failure to comply may result in electric shock. ◆ Before inspection or maintenance, wait at least 10 minutes so that residual voltage can discharge safely.
⚠ Warning ◆ Following the terms defined in the warranty agreement to repair the product. ◆ When the equipment has a fault or is damaged, follow the instructions of the professionals to perform troubleshooting or maintenance, and keep a maintenance record. ◆ Following the instructions of the quick-wear parts instructions to replace the damaged parts. ◆ Do not continue to use the damaged equipment. Failure to comply may result in worse damages. ◆ After replacement, perform a re-check of the wiring and specifications.

Disposal
⚠ Warning ◆ Following the local regulations or standards to dispose the retired equipment or products. Failure to comply may result in property damage or even death. ◆ Following the industry waste disposal standards to recycle the scrapped equipment to avoid environmental pollution.

Safety signs

To guarantee safety operations and maintenance of the equipment, follow the safety stickers on the equipment and products. Do not stain or remove the safety signs. Instructions of safety signs are as follows:

Safety signs	Instructions
	◆ Read this notice before installation and operation. Failure to comply may result in electric shock. ◆ Do not remove the cover within 10 minutes of power-off. ◆ During maintenance, inspection or wiring, you may start operation at least 10 minutes after power-off at the input/output terminal when the power indicators are completely off.

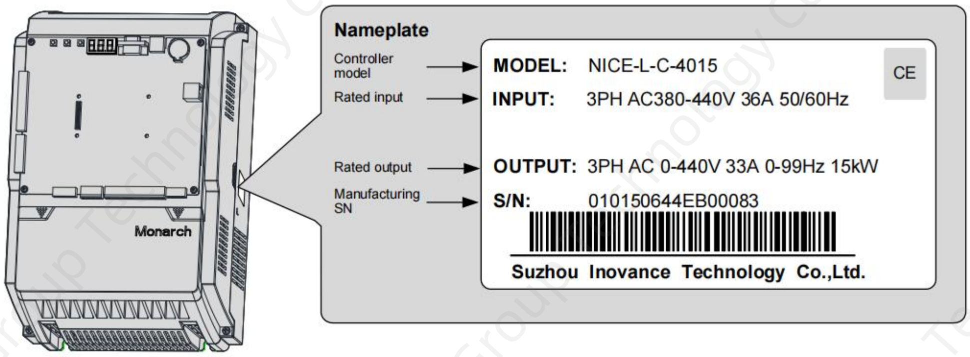
Memo NO. __________

Date / /

1 Product Information

1.1 Designation Rule and Nameplate

Controller nameplate



Controller model

NICE -L - C - 40 15

Mark	Series
NICE	NICE series integrated elevator controller

Mark	Controller Type
L	Specialized for elevators

Mark	Motor Type
A	Asynchronous motor
B	Synchronous motor
C	Synchronous/Asynchronous motor integrator

Mark	Power Class
02	2.2kW
03	3.7kW
...	...
37	37kW
45	45kW
...	...
160	160kW

Customized (45 to 160)

Mark	Voltage Class
20	Single-phase/ Three-phase 220 V
40	Three-phase 380 V

Manufacturing SN

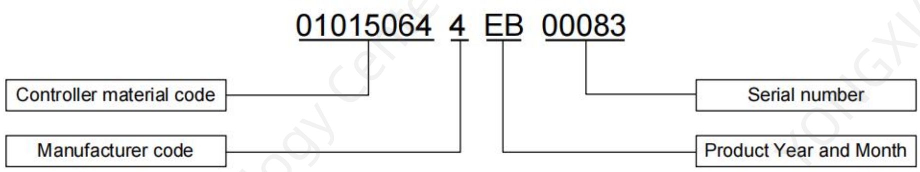


Figure 1-1 Designation rules, nameplate, and manufacturing SN of the NICE3000^new

■ Manufacturing SN Rules

Manufacturing SN: Item (8-bit) + Manufacturer code (1-bit) + Year (1-bit) + Month (1-bit) + Serial number (5-bit)

Expressed as: XXXXXXXX X X X XXXXX (an16, alphanumeric, fixed length of 16 bits)

Manufacturing SN Bit	Description
1 to 8	Material code (Item code in the product BOM)
9	Manufacturer code
10	Year: For example, 2009 is expressed as 9, 2010 as A, …Z and so on (I/L/O/Q forbidden)
11	Month: 1, 2, 3...9, A (10), B (11), and C (12)
12 to 16	5-bit decimal serial number (00001 to 99999)

1.2 Description of components

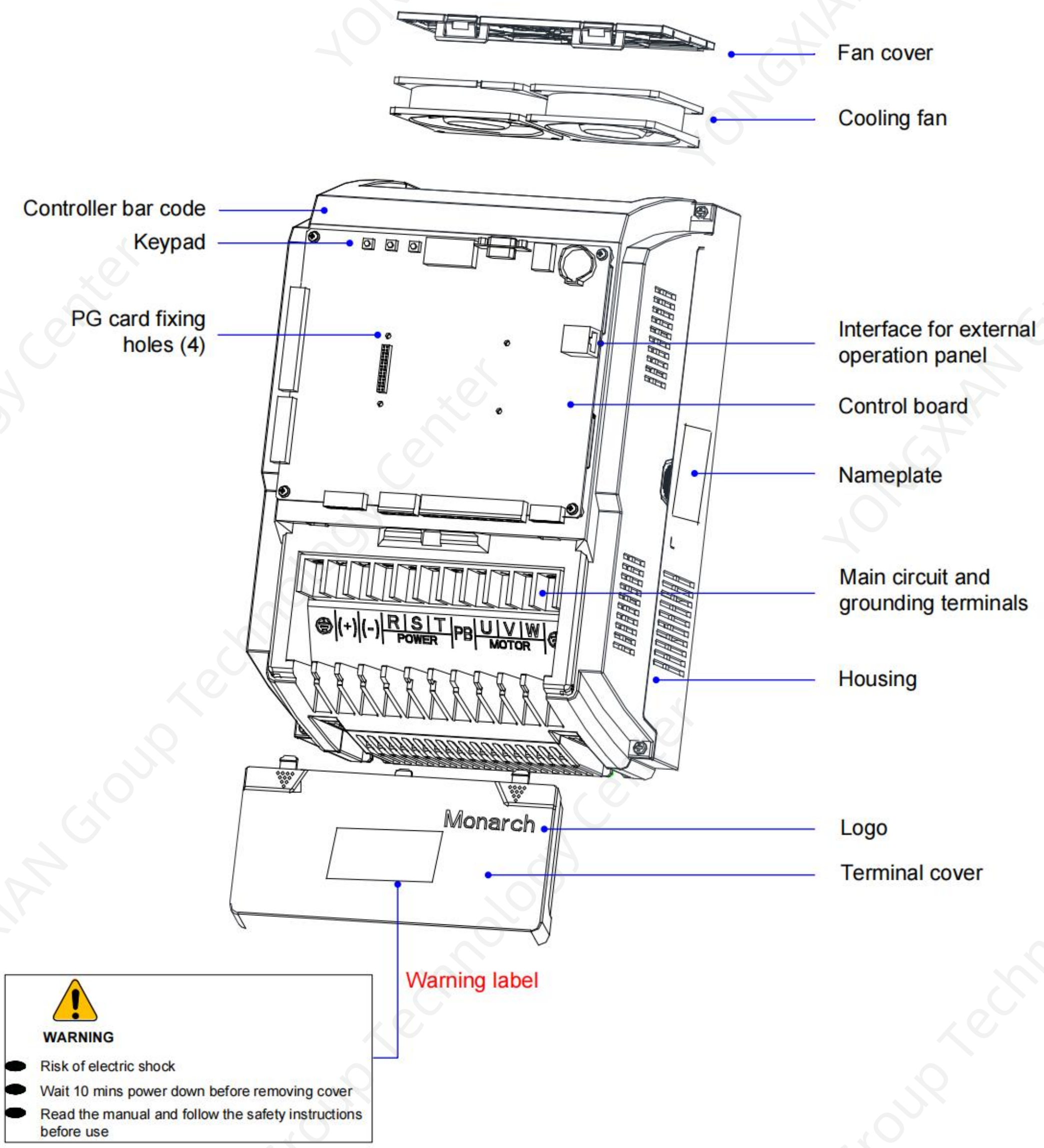


Figure 1-2 Component view of the plastic structure (NICE-L-C-4002 to NICE-L-C-4015)

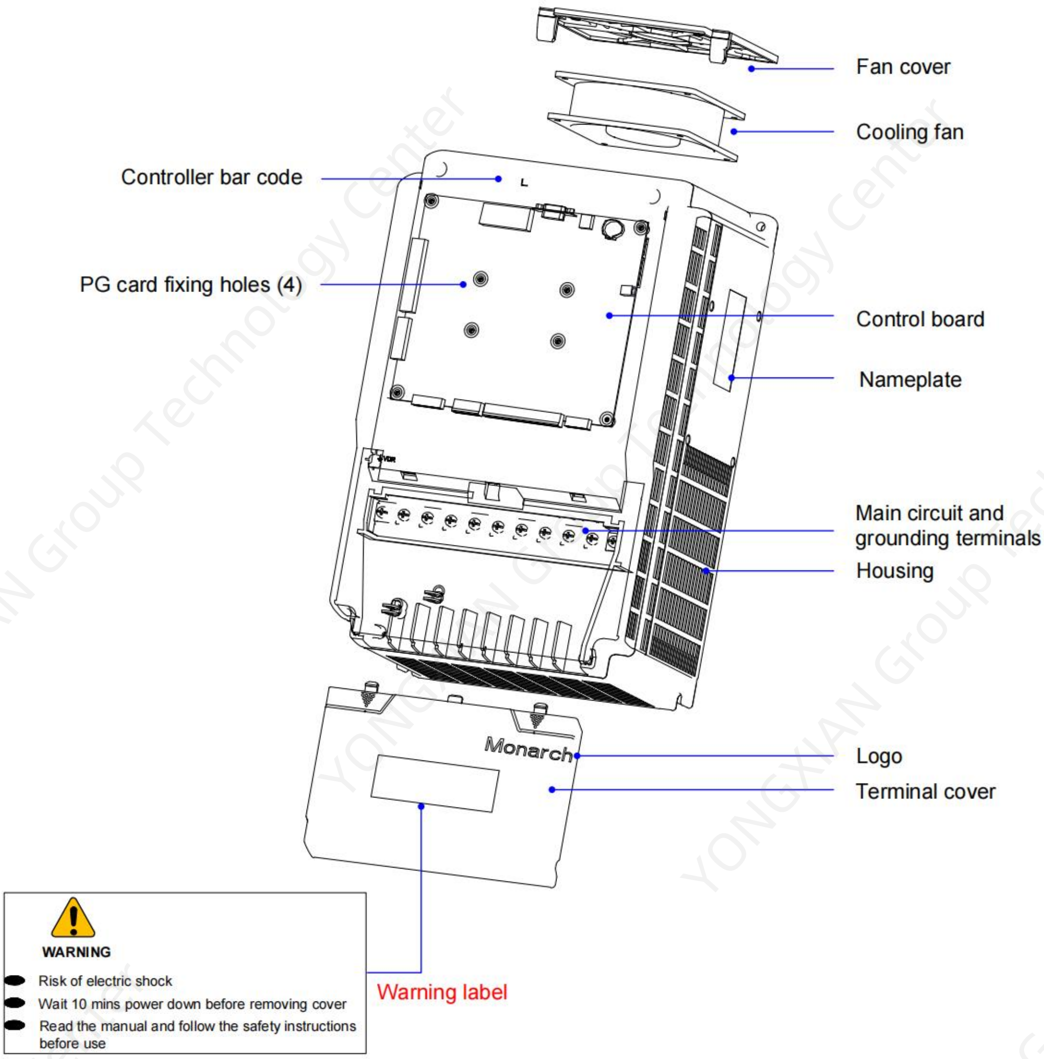


Figure 1-3 Component view of the plastic structure (NICE-L-C-4018F to NICE-L-C-4037F)

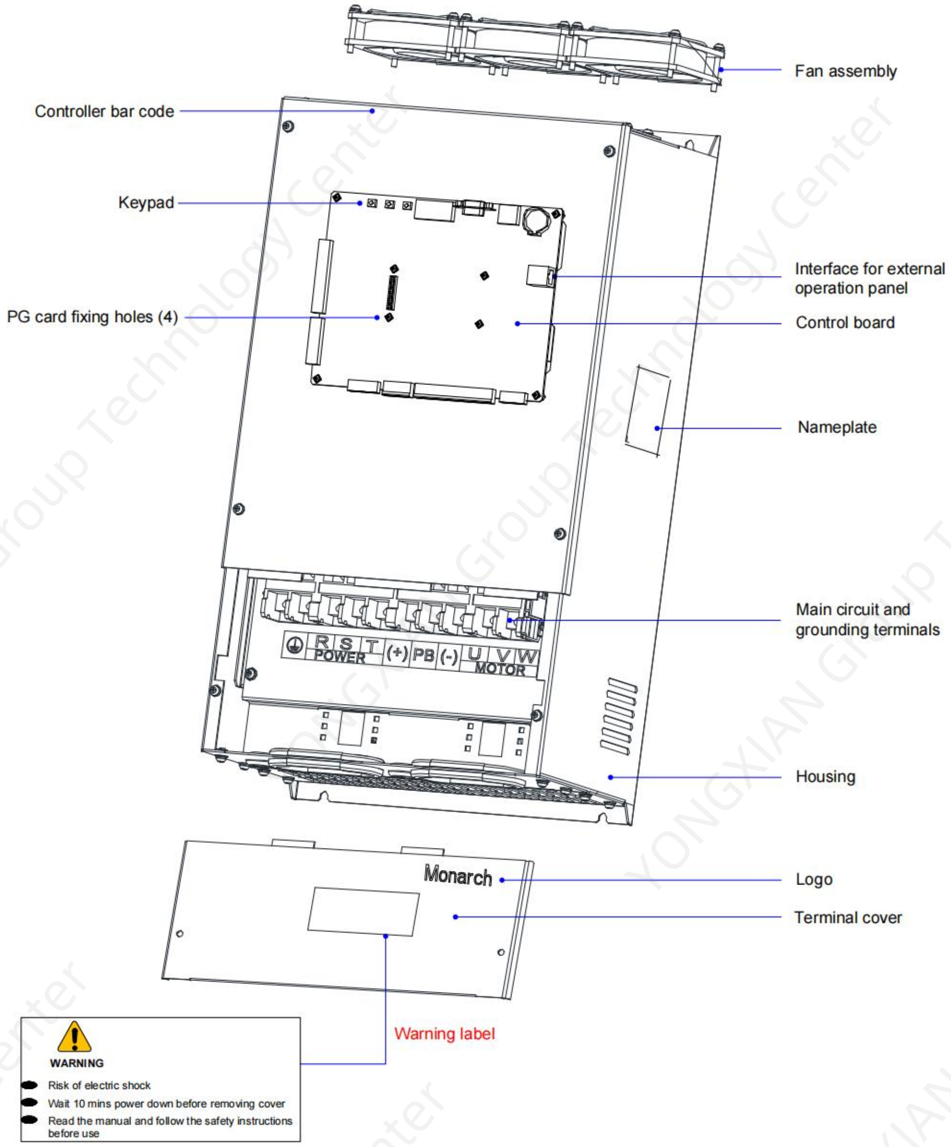


Figure 1-4 Component view of the sheet metal structure (NICE-L-C-4018 to NICE-L-C-4030)

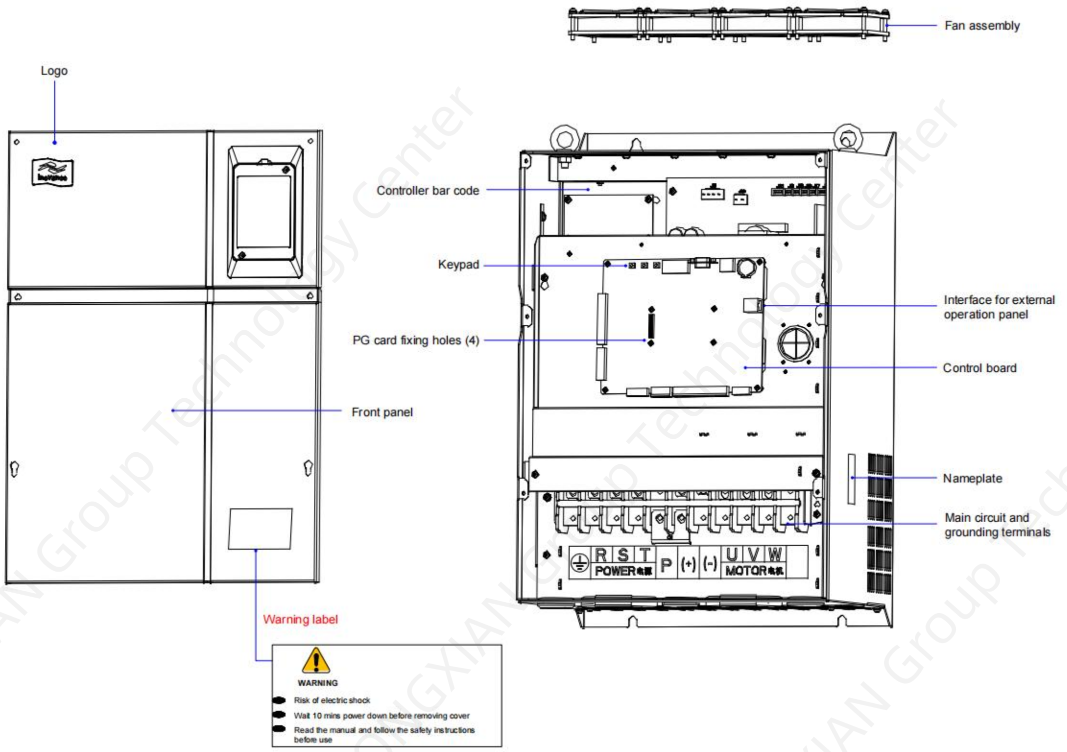


Figure 1-5 Component view of the sheet metal structure (NICE-L-C-4037 to NICE-L-C-4055)

NOTE

◆ The preceding figures show the component diagrams of only common models 2.2 to 55 kW. For the structure of higher power ratings, contact Inovance.

1.3 Technical Data

Table 1-1 Main technical data of NICE3000new

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Applicable Motor (kW)
Single-phase 220 V, range: 220–240 V, 50/60 Hz				
NICE-L-C-2002	2.0	9.2	5.2	1.1
NICE-L-C-2003	2.9	13.3	7.5	1.5
220-NICE-L-C-4007	3.9	17.9	10.3	2.2
220-NICE-L-C-4011	5.9	25.3	15.5	3.7
220-NICE-L-C-4015	7.3	31.3	19	4.0
220-NICE-L-C-4018	8.6	34.6	22.5	5.5
220-NICE-L-C-4018F				
220-NICE-L-C-4022	10.6	42.6	27.7	11
220-NICE-L-C-4022F				
220-NICE-L-C-4030	13.1	52.6	34.6	15
220-NICE-L-C-4030F				

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Applicable Motor (kW)
Three-phase 220 V, range: 220–240 V, 50/60 Hz				
NICE-L-C-2002	4.0	11.0	9.6	2.2
NICE-L-C-2003	5.9	17.0	14.0	3.7
220-NICE-L-C-4007	7.0	20.5	18.0	4.0
220-NICE-L-C-4011	10.0	29.0	27.0	5.5
220-NICE-L-C-4015	12.6	36.0	33.0	7.5
220-NICE-L-C-4018 220-NICE-L-C-4018F	15.0	41.0	39.0	11.0
220-NICE-L-C-4022 220-NICE-L-C-4022F	18.3	49.0	48.0	15.0
220-NICE-L-C-4030 220-NICE-L-C-4030F	23.0	62.0	60.0	18.5
Three-phase 380 V, range: 380–440 V, 50/60 Hz				
NICE-L-C-4002	4.0	6.5	5.1	2.2
NICE-L-C-4003	5.9	10.5	9.0	3.7
NICE-L-C-4005	8.9	14.8	13.0	5.5
NICE-L-C-4007	11.0	20.5	18.0	7.5
NICE-L-C-4011	17.0	29.0	27.0	11.0
NICE-L-C-4015	21.0	36.0	33.0	15.0
NICE-L-C-4018F	24.0	41.0	39.0	18.5
NICE-L-C-4022F	30.0	49.5	48.0	22.0
NICE-L-C-4030F	40.0	62.0	60.0	30.0
NICE-L-C-4037F	57.0	77.0	75.0	37.0
NICE-L-C-4045 NICE-L-C-4045F	69.0	93.0	91.0	45.0
NICE-L-C-4055 NICE-L-C-4055F	85.0	113.0	112.0	55.0
NICE-L-C-4075 NICE-L-C-4075F	114.0	157.5	150.0	75.0
NICE-L-C-4090	134.0	180.0	176.0	90.0
NICE-L-C-4110	160.0	214.0	210.0	110.0
NICE-L-C-4132	192.0	256.0	253.0	132.0
NICE-L-C-4160	231.0	307.0	304.0	160.0

NOTE

- NICE-L-C-4018 to NICE-L-C-4037 are not major models. Their parameters are consistent with those of NICE-L-C-4018F to NICE-L-C-4037F.

1.4 Technical Specifications

Table 1-2 Technical specifications

Item		Specifications
Input power supply	Phase number, voltage, and frequency	200V class: single-phase 180V AC to 240V AC, 50Hz/60Hz
		380V class: three-phase 330V AC to 440V AC, 50Hz/60Hz
		480V class: three-phase 440V AC to 500V AC, 50Hz/60Hz
	Allowed voltage change	-15% to +10%
	Allowed frequency change	-5% to +5%
	Capacity to withstand transient voltage drop	200 V class: The system continues to run at over 150 VAC. When the voltage is reduced to below 150 VAC from the rated input state, undervoltage protection is enabled after the system continues to run for 15 ms. 400V class: The system continues to run at over 300 VAC. When the voltage is reduced to below 300 VAC from the rated input state, undervoltage protection is enabled after the system continues to run for 15 ms.
Basic features	Maximum number of floors	40 floors
	Elevator running speed	⩽ 4.00 m/s
	Number of elevators in parallel/group mode	⩽ 8 sets
	Communication mode	CAN bus serial communication
	Operation functions	Refer to product functions in introduction.

Item		Specifications
Drive features	Control mode	Vector control with a PG card
	Startup torque	Up to 200%, depending on the load
	Speed control range	1:1000 (Vector control with a PG card)
	Speed control precision	±0.05% (Vector control with a PG card, 25 ± 10°C)
	Torque limit	200% of the rated torque
	Torque precision	±5%
	Frequency control range	0 to 99 Hz
	Frequency precision	±0.1%
	Set resolution of frequency	0.01 Hz/99 Hz
	Output frequency resolution (Calculated resolution)	0.01Hz
	No-load startup compensation	In the event that the elevator load size is unknown, an appropriate torque is applied to the motor according to the elevator running direction, achieving smooth startup, minimizing jerk at the moment of startup and improving the riding comfort.
	Braking torque	150% (External braking resistor), built-in braking unit
	Acceleration/ Deceleration time	0.1 to 8s
	Carrier frequency	2 to 16kHz
	Battery running	Upon power failure, the elevator performs leveling at the nearest floor at a low speed using power supply from the battery.
PG interface	Type of PG card	Open collector, push-pull, differential, sin/cos, and endat absolute value types
	Frequency dividing output of PG card signal	OA orthogonal to OB
I/O signal	Optocoupler input control power supply	Isolation 24 VDC
	Low voltage optocoupler isolation input	24 x DI. Optocoupler control signals are isolation 24 VDC power input signals.
	High voltage optocoupler isolation input	3 x DI
	Relay output	6 normally open contacts, single-pole single-throw, 5 A contact switchover capability, contact load (Resistive): 5A250VAC or 5A28VDC
	USB interface	Commissioning by cell phone
	CAN communication port	2 communication ports (Car top communication, parallel or group control)
	MOD communication	2 communication ports (Outbound communication, residential area monitoring or Internet of Things)
	Analog input port	1 single-ended or differential input, input voltage range -10 V to +10 V, precision 0.1%

Item		Specifications
Protection features	Motor overload protection	A motor protection curve can be set in a parameter.
	AC drive overload	60s for 150% of the rated current, 10s for 200% of the rated current
	Short circuit protection	The drive controller is protected when any two-phase short circuit on the output side causes overcurrent.
	Phase loss protection	The AC drive provides the phase loss detection function. In case of incorrect input phase sequence, the control system will report phase loss, stopping the running of the elevator and preventing accidents.
	Overvoltage threshold	Bus voltage 800 V (for 380 V series) and 400 V (for 220 V series)
	Undervoltage threshold	Bus voltage 350V (for 200V series) and 150V (for 220 V series)
	Compensation due to instantaneous power failure	Protection if instantaneous power failure time is more than 15 ms
	Heatsink overheating	Protection by the thermistor
	Stall prevention	Stall protection when the speed deviation is greater than 15% of the rated speed during running
	Rotary encoder abnormality	Rotary encoder abnormalities include rotary encoder phase loss, reverse direction, cable breaking, pulse interference, etc. In these cases, the system will perform protection immediately to prevent accidents.
	Braking unit protection	The braking unit is protected when it is automatically detected to be normal.
	Module protection	Overcurrent, short circuit and overheat protection
	Current sensor protection	Self-test at power-on
	Speed abnormality protection	When the encoder feedback speed exceeds a limit or the deviation between the torque limit and the speed test feedback is excessive, the system will immediately perform protection, give an alarm immediately and prohibit rerunning, achieving quick protection against abnormal elevator speed.
	Input overvoltage protection	Over 725 V for 400 V class, over 360 V for 200 V class, detection upon stop
	Output grounding protection	When any phase is short-circuited to ground during running, output is cut off to protect the AC drive.
	Output imbalance protection	When three-phase current output imbalance is detected during running, output is cut off to protect the AC drive.
	Braking resistor short circuit protection	Detection during braking
	Running time limiter protection	Protection if the time for passing a floor exceeds a specified time during running
	Leveling switch abnormality protection	Leveling switch abnormalities include leveling switch failure and sticking. The system judges both abnormalities according to the feedback change process of leveling signals. If there is no change in leveling signals, the system will give an alarm.
	EEPROM fault	Self-test at power-on

Item		Specifications
Operation and display	Keypad	3-digit LED display, implementing certain commissioning functions
	Operation panel	5-digit LED display, querying/modifying most parameters and monitoring the system state
	Host computer software	Connecting the control system and the host computer, convenient for viewing/modifying the system state.
Environment	Ambient temperature	-10°C to 50°C (De-rated if the ambient temperature is above 40°C)
	Humidity	Less than 95% RH, non-condensing
	Vibration	Less than 5.9 m/s^2 (0.6 g)
	Storage temperature	-20°C to 60°C (Short-term temperature in transit)
	Operation place	Indoor (Place free of corrosive gas and dust)
	Pollution degree	PD2
	IP level	IP20
	Power distribution system	TN/TT
	Altitude	Below 1000 m (De-rated by 1% for each 100 m higher if the altitude is above 1000 m)
Structure	IP level	IP20
	Cooling mode	Forced air cooling
	Installation method	Cabinet-mounted

1.5 System Configuration

The NICE3000^{new} series integrated elevator control system combines the functions of both elevator controller and the high-performance vector AC drive. It mainly includes the integrated elevator controller, car top board (MCTC-CTB), hall call board (MCTC-HCB), car call board (MCTC-CCB), and optional door pre-open module and remote monitoring system. The following figure shows the system components.

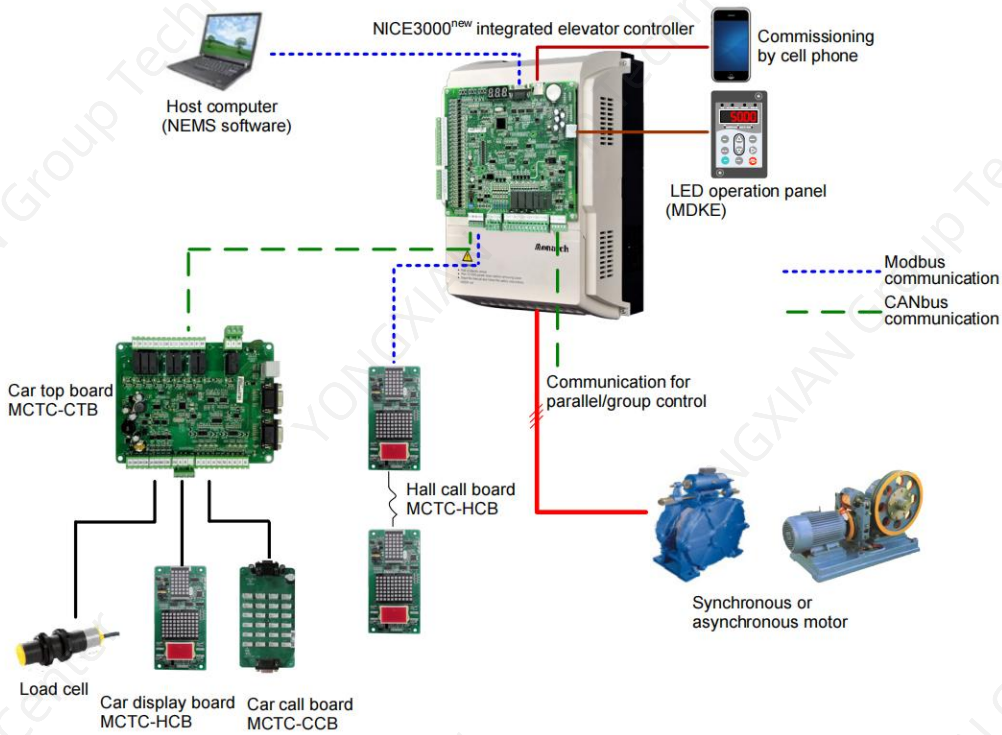


Figure 1-6 System components of the NICE3000^{new}

1 The NICE3000^{new} controls the motor based on feedback signals from the encoder, and records information of all position switches in the shaft by pulse, implementing accurate leveling and direct travel ride and guaranteeing running safety.

2 The NICE3000^{new} implements information collection and control of car-related components by means of CANbus communication with the MCTC-CTB.

3 The NICE3000^{new} registers and displays hall calls of all floors with easy address setting by means of Modbus communication with the MCTC-HCB.

The following figure shows the system structure of the NICE3000^{new}.

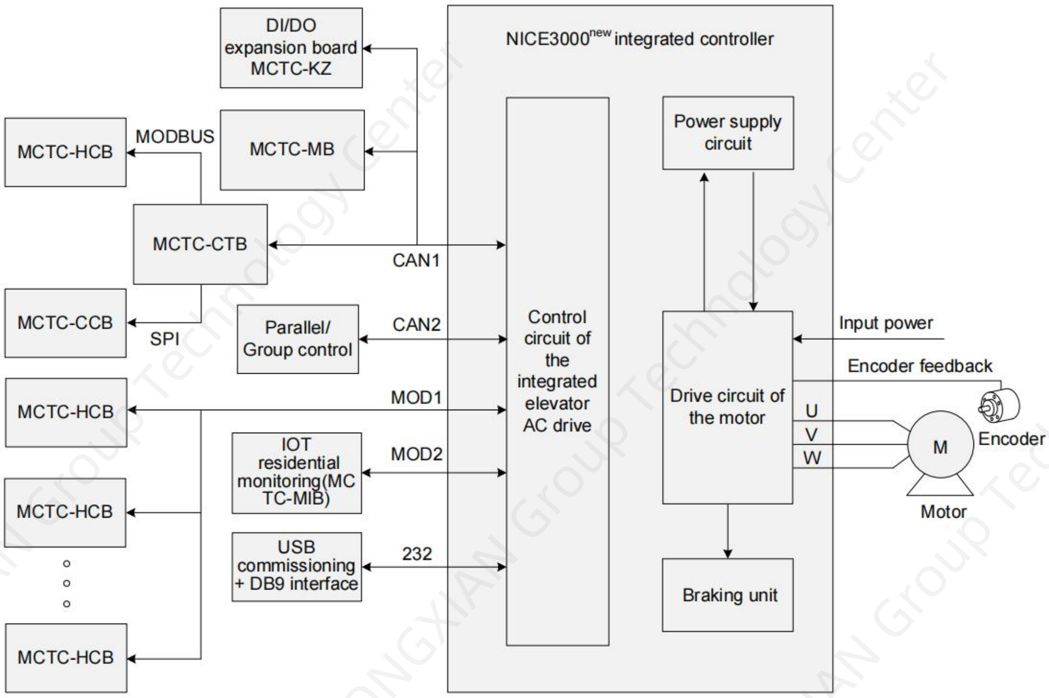


Figure 1-7 System structure of the NICE3000ne

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2 Installation and Wiring

2.1 Installation

2.1.1 Installation Environment Requirements

Table 2-1 Environment requirements

Item	Requirement
Altitude	Below 1000 m; de-rated by 1% for each 100 m higher if the altitude is above 1000 m; maximum 3000 m.
Ambient temperature	-10°C to 50°C; air temperature change of less than 0.5°C/min; rated current derated by1.5% for each 1°C higher if the ambient temperature is above 40°C; maximum temperature 50°C
Storage temperature	-40°C to 60°C
Ambient humidity	Less than 95% RH, non-condensing
Storage humidity	Less than 95% RH, non-condensing
Vibration and shock	Sinusoidal vibration: 5.9 m/s^2 (0.6 g) at 2-200 Hz
IP level	IP20
Heat dissipation and ventilation	Install the AC controller on the backplate, and ensure that there is sufficient space around for heat dissipation.
Mounting location	Free from direct sunlight Free from over 95% humidity and condensation Free from corrosive, explosive and combustible gas Free from oil dirt, dust and metal powder Free from vibration (Vibration ⩽ 0.6 g)
Protective enclosure	The controller must be installed inside a cabinet. The final system installing the controller must have covers providing fire, electrical, and mechanical protection, and satisfy the regional laws & regulations and related IEC requirements.

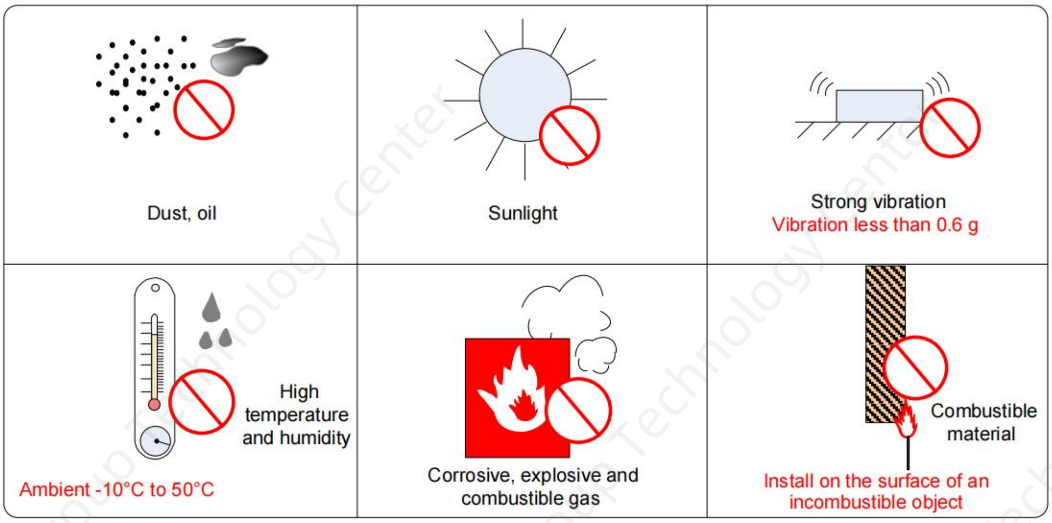
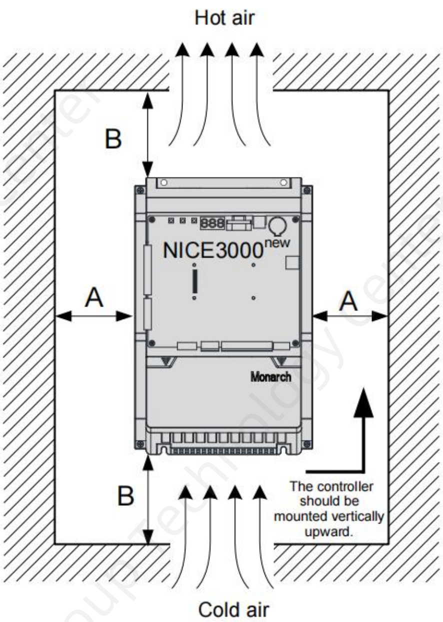


Figure 2-1 Schematic diagram of environment requirements

2.1.2 Mounting Clearance Requirements

The clearance that needs to be reserved varies with the power rating of the NICE-3000^{new}, as shown in the following figure.



Mounting clearance requirements of the NICE3000^{new} with different power ratings

Power Rating	Clearance	
2.2–15 kW	A ≥ 10 mm	B ≥ 100 mm
18.5–55kW	A ≥ 50 mm	B ≥ 100 mm

Figure 2-2 Clearance for mounting

Heat of the NICE3000[new] is dissipated from bottom to top during heat dissipation, as shown in the following figure.

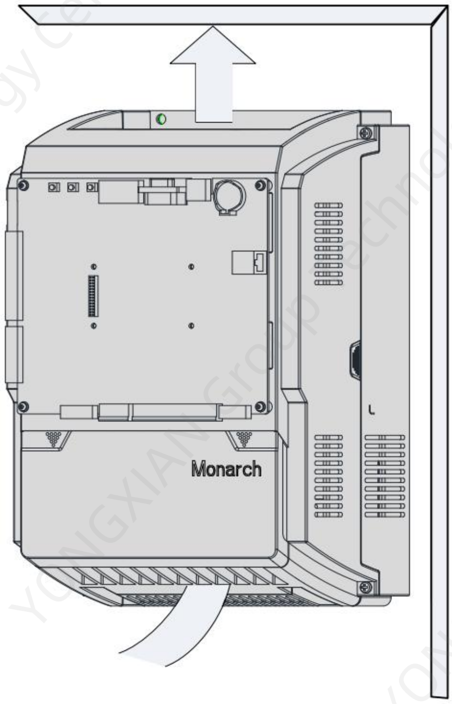


Figure 2-3 Heat dissipation diagram

2.1.3 Mounting Orientation Requirements

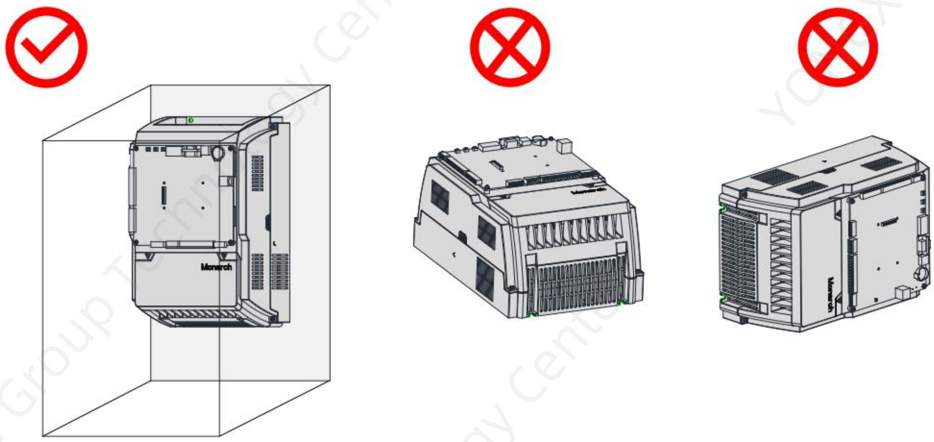


Figure 2-4 Mounting orientation of the controller

2.1.4 Mounting Dimensions Requirements

The following figures show the mounting dimension diagrams of main structures.

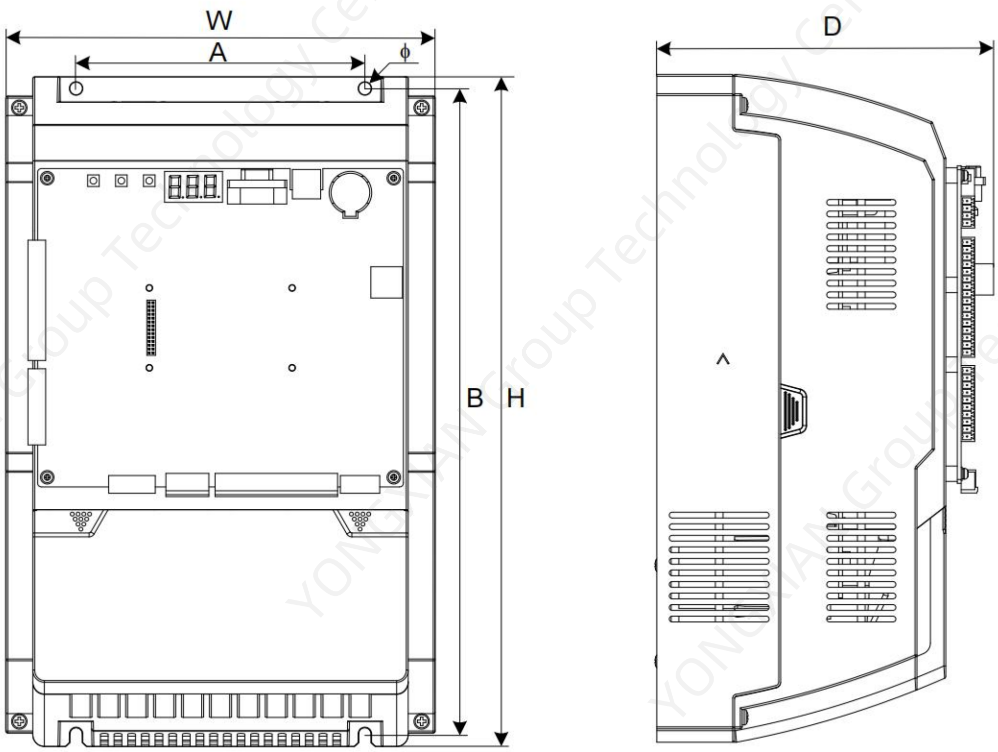


Figure 2-5 Overview and installation dimensions of the plastic structure 2.2–15 kW

Table 2-2 Installation dimensions of the plastic structure 2.2–15 kW

Controller Model	Structure	Physical Dimensions H (mm)	Physical Dimensions W (mm)	Physical Dimensions D (mm)	Mounting Hole A (mm)	Mounting Hole B (mm)	Hole Diameter Φ (mm)	Gross Weight (kg)
Single/Three-phase 220 V, range: 220 — 240 V								
NICE-L-C-2002	Plastic	347	223	143	150	334.5	6.5	5.5
NICE-L-C-2003								
220-NICE-L-C-4007	Plastic	347	223	172.5	150	334.5	6.5	7
220-NICE-L-C-4011								
220-NICE-L-C-4015								
Three-phase 380 V, range: 380 — 440 V								
NICE-L-C-4002	Plastic	347	223	143	150	334.5	6.5	5.5
NICE-L-C-4003								
NICE-L-C-4005								
NICE-L -C-4007	Plastic	347	223	173.5	150	334.5	6.5	7
NICE-L -C-4011								
NICE-L -C-4015								

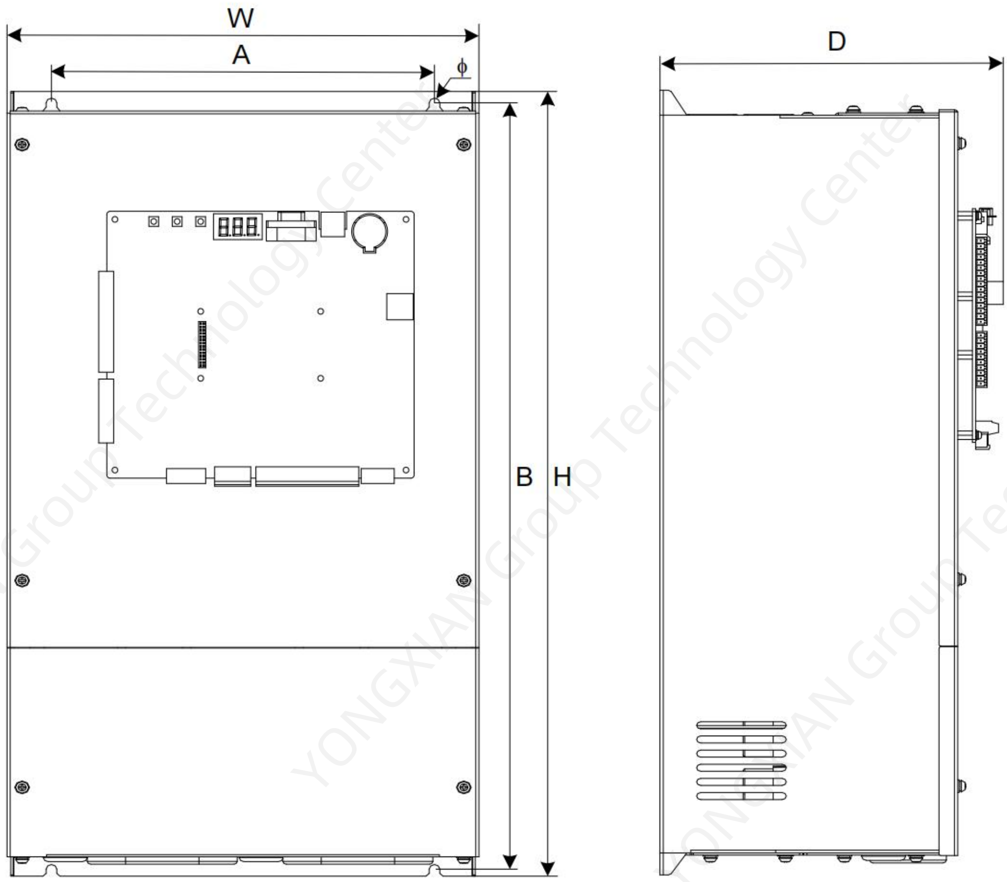


Figure 2-6 Overview and installation dimensions of the sheet metal structure 18.5–30 kW

Table 2-3 Installation dimensions of the sheet metal structure 18.5–30 kW

Controller Model	Structure	Physical Dimensions			Mounting Hole		Hole Diameter	Gross Weight (kg)
		H (mm)	W (mm)	D (mm)	A (mm)	B (mm)	Φ (mm)	
Single/Three-phase 220 V, range: 220 — 240 V								
220-NICE-L-C-4018	Sheet metal	554.5	289.6	207.7	235	541.5	6.5	14.5
220-NICE-L-C-4022								
220-NICE-L-C-4030								
Three-phase 380 V, range: 380 — 440 V								
NICE-L-C-4018	Sheet metal	554.5	289.6	223	235	541.5	6.5	14.5
NICE-L-C-4022								
NICE-L-C-4030								

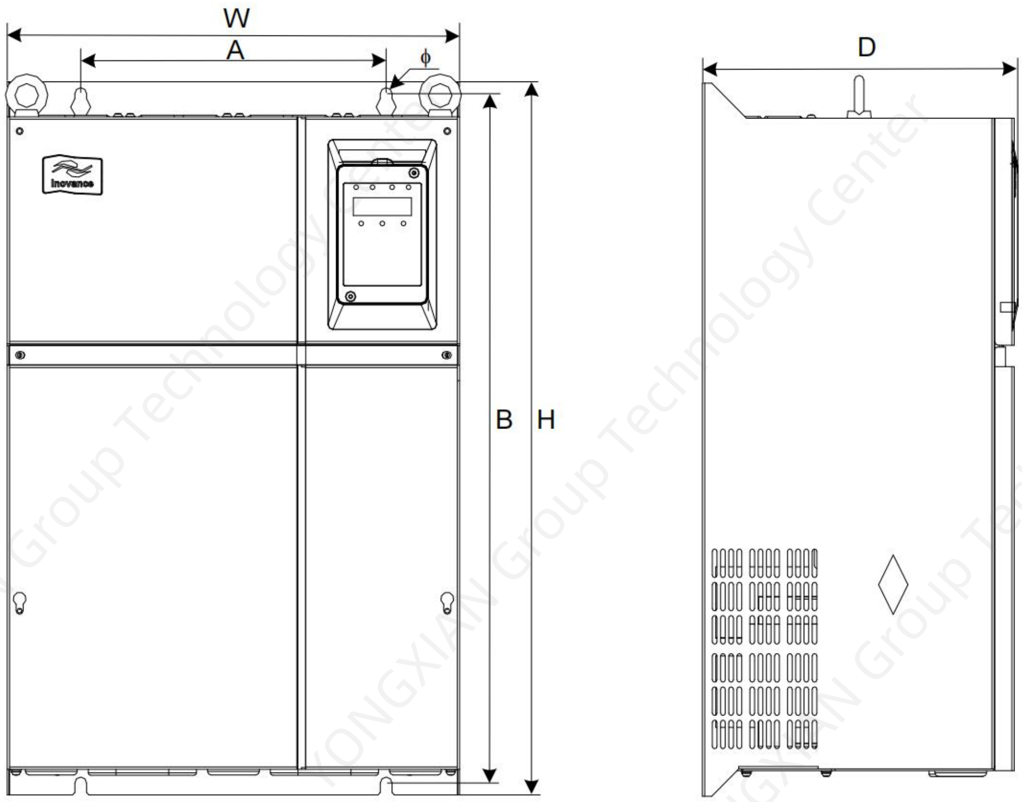


Figure 2-7 Overview and installation dimensions of the sheet metal structure 37–160 kW

Table 2-4 Installation dimensions of the sheet metal structure 37–160 kW

Controller Model	Structure	Physical Dimensions			Mounting Hole		Hole Diameter	Gross Weight (kg)
		H (mm)	W (mm)	D (mm)	A (mm)	B (mm)	Φ (mm)	
Three-phase 380 V, range: 380 — 440 V								
NICE-L-C-4037	Sheet metal	600	385	268.42	260	580	10	32
NICE-L-C-4045								
NICE-L-C-4055								
NICE-L-C-4075	Sheet metal	700	473	307	343	678	10	47
NICE-L-C-4090								
NICE-L-C-4110	Sheet metal	930	579	380	449	903	10	90
NICE-L-C-4132								
NICE-L-C-4160								

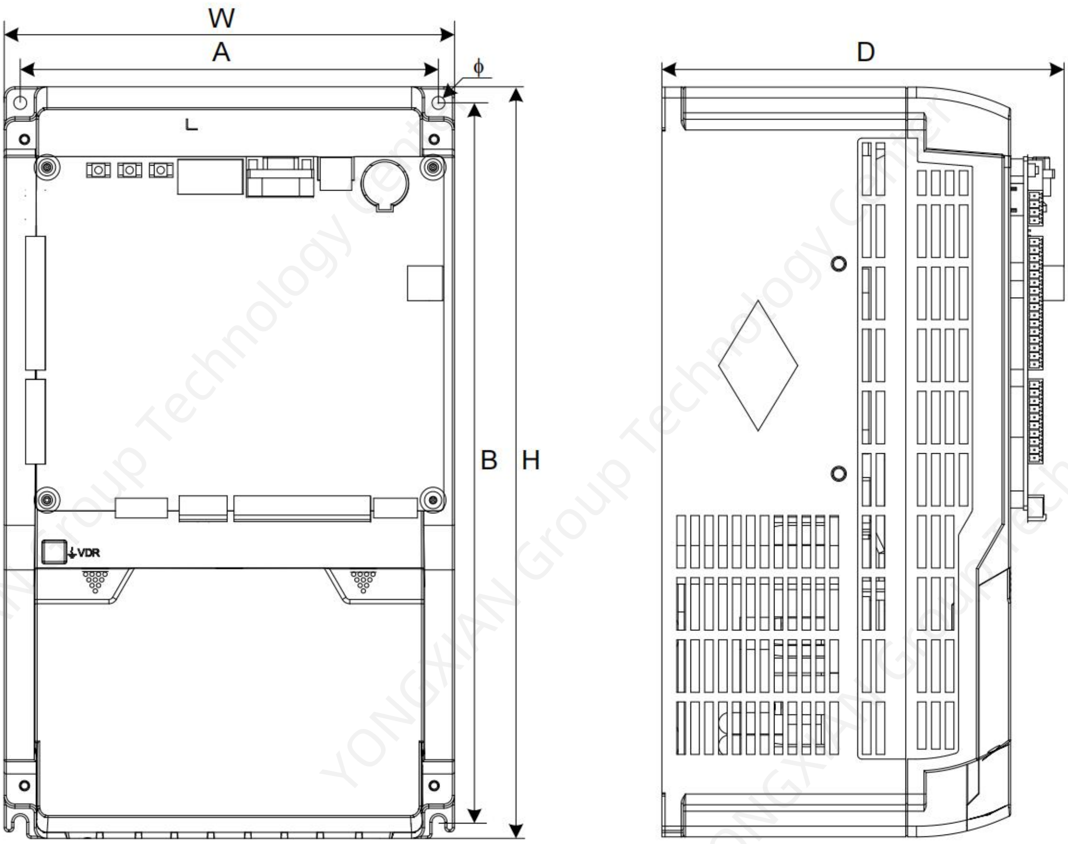


Figure 2-8 [F model] Overview and installation dimensions of the plastic structure 18.5–37 kW

Table 2-5 [F model] Installation dimensions of the plastic structure 18.5–37 kW

Controller Model	Structure	Physical Dimensions			Mounting Hole		Hole Diameter	Gross Weight (kg)
		H (mm)	W (mm)	D (mm)	A (mm)	B (mm)	Φ (mm)	
Single/Three-phase 220 V, range: 220 — 240 V								
220-NICE-L-C-4018F	Plastic	350	210	188	195	335	6	7.1
220-NICE-L-C-4022F								
220-NICE-L-C-4030F		400	250	211.5	230	380	7	17.5
Three-phase 380 V, range: 380 — 440 V								
NICE-L-C-4018F	Plastic	350	210	188	195	335	6	7.1
NICE-L-C-4022F								
NICE-L-C-4030F	Plastic	400	250	211.5	230	380	7	15.5
NICE-L-C-4037F								

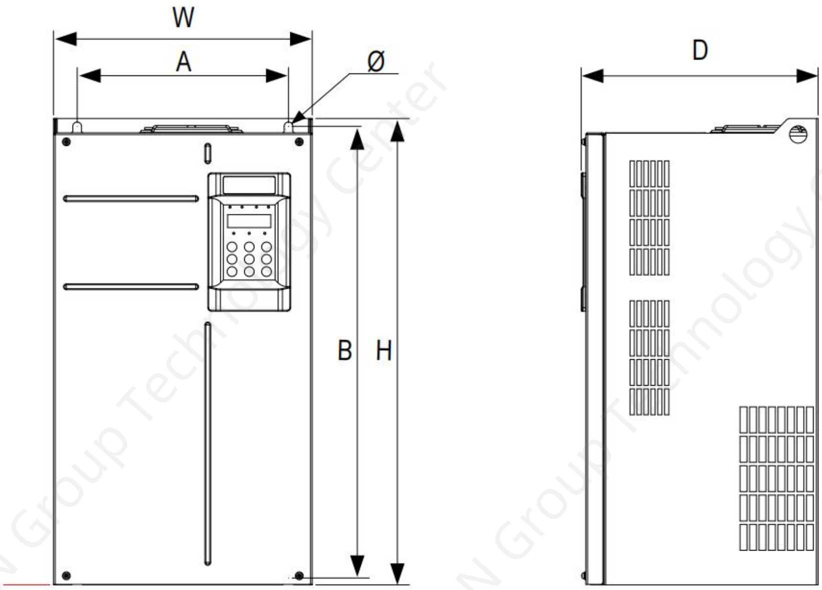


Figure 2-9 [F model] Overview and installation dimensions of the sheet metal structure 45–75 kW

Table 2-6 [F model] Installation dimensions of the sheet metal structure 45–75 kW

Controller Model	Structure	Physical Dimensions			Mounting Hole		Hole Diameter	Gross Weight (kg)
		H (mm)	W (mm)	D (mm)	A (mm)	B (mm)	Φ (mm)	
Three-phase 380 V, range: 380 — 440 V								
NICE-L-C-4045F	Sheet metal	542	300	275	245	523	10	35
NICE-L-C-4055F								
NICE-L-C-4075F		580	338	315	270	560	10	51.5

2.1.5 Mounting Procedure

The NICE3000^{new} is generally mounted into the control cabinet by using the wall-mounting method. The plastic structure and sheet metal structure have the same mounting method. The following figure shows the mounting diagram:

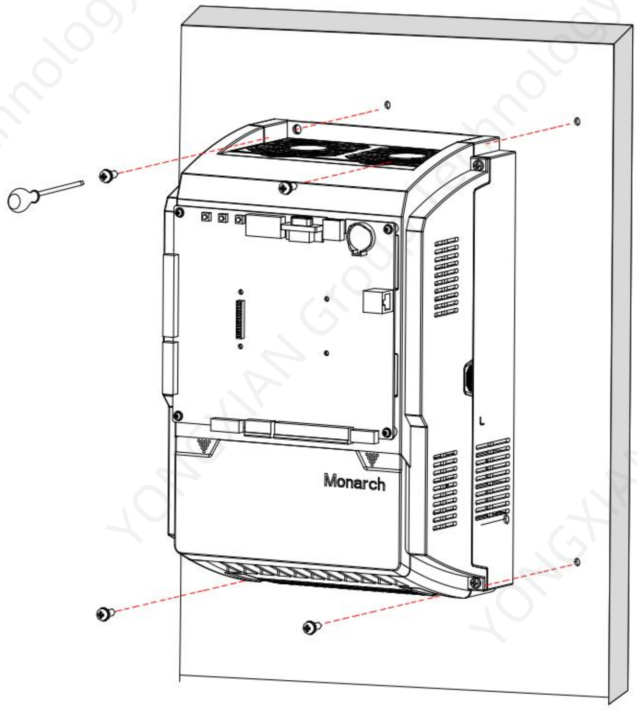


Figure 2-10 Wall-mounting diagram

NOTE

◆ It is forbidden to fasten only the upper two screws, because the controller may fall and be damaged due to uneven force after long-time running. Ensure that all the four screws are fastened.

Pay attention to the following points when designing the control cabinet:

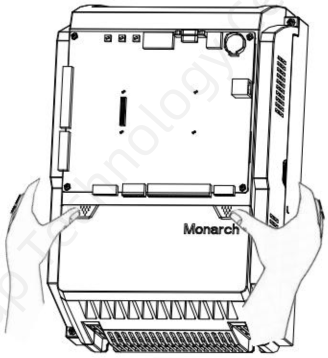
1) The temperature inside the cabinet must not rise to 10°C higher than the temperature outside the cabinet.
2) A closed control cabinet must be configured with a fan (or other air cooling device such as air conditioner) to ensure air circulation.
3) The air from the fan must not blow directly to the drive unit because this easily causes dust adhesion and further a fault on the drive unit.
4) A vent must be available at bottom of the control cabinet to form bottom-up air flow, which prevents heat island effect on the surface of components or partial thermal conductivity effect.
5) If the fan cannot meet the cooling requirements, install an air conditioner in the cabinet or in the equipment room. Note that the temperature inside the cabinet must not be too low; otherwise, condensation may occur, causing short-circuit of components.
6) For special environment where the temperature is high but cannot be reduced effectively, de-rate the controller during use.

2.1.6 Removing and Reattaching Front Cover

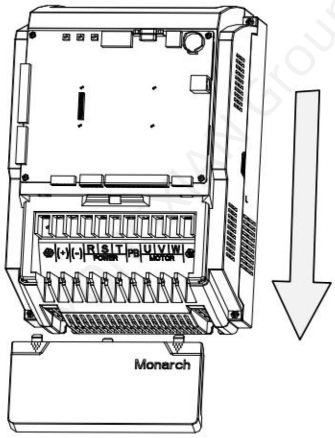
1 Removing and reattaching the terminal cover with plastic structure

Removing procedure

1) Put the thumbs on the positions shown in the figure, and press downward so that the cover is detached.

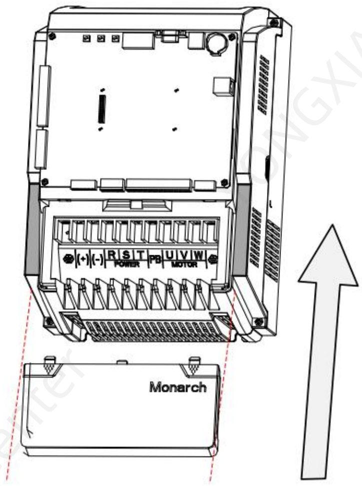


2) Push the cover in the arrow direction. Removal is completed.

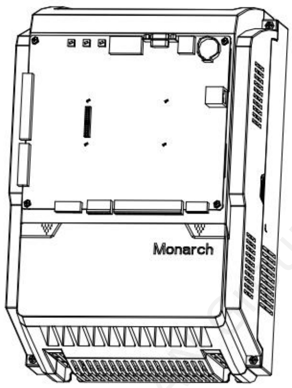


Reattaching procedure

1) Align the cover with the edges of the controller and push in the arrow direction.



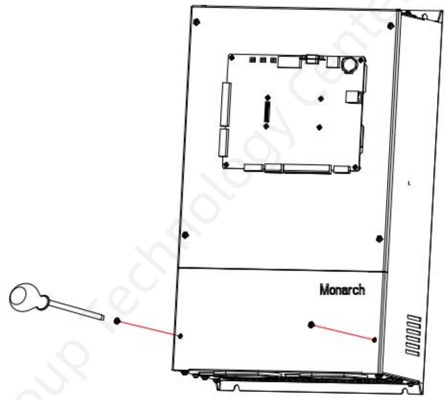
2) Clamp the cover. Reattaching is completed.



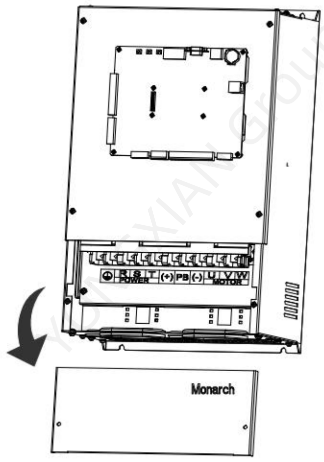
2 Removing and reattaching the terminal cover with sheet metal structure

Removing procedure

1) Loosen two screws on the terminal cover with a screwdriver.

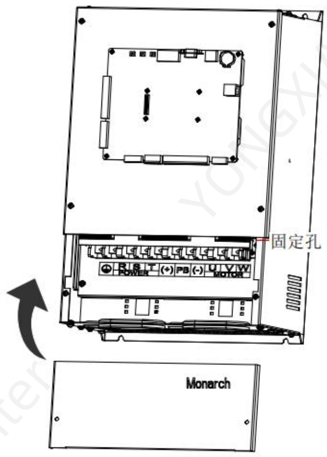


2) Pull down the cover.

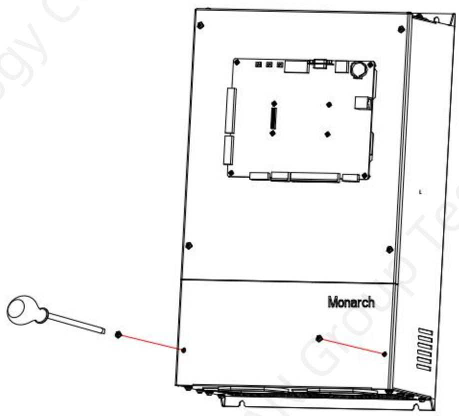


Reattaching procedure

1) Align the upper part of the cover with the fixing holes.



1) Tighten two screws on the terminal cover with a screwdriver.



2.2. Wiring

The following figure shows overall terminal arrangement of the NICE3000^{new}.

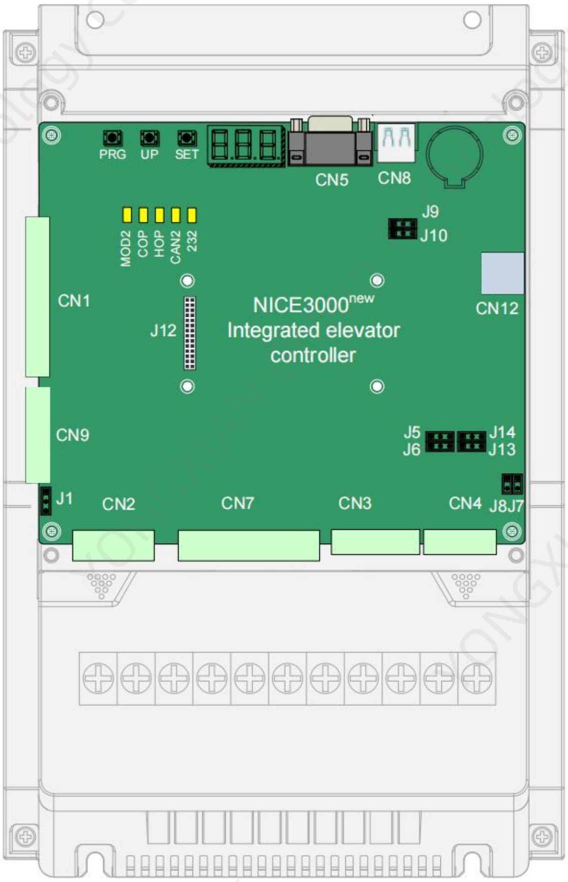
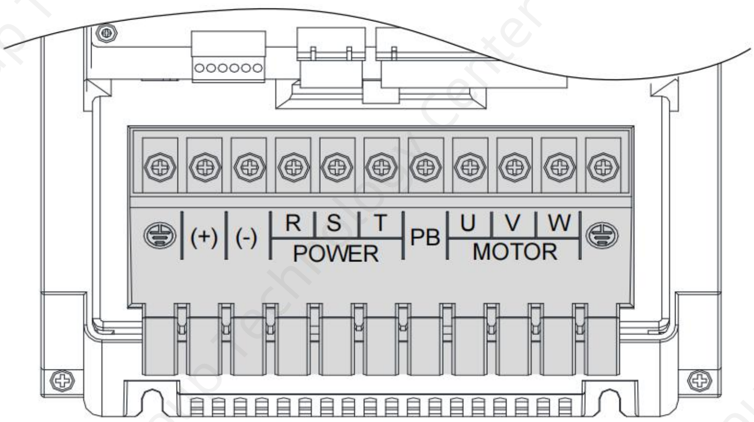


Figure 2-11 Overall terminal arrangement of the NICE3000^{new}

2.2.1 Description and Wiring of Main Circuit Terminals

1 Terminal Layout



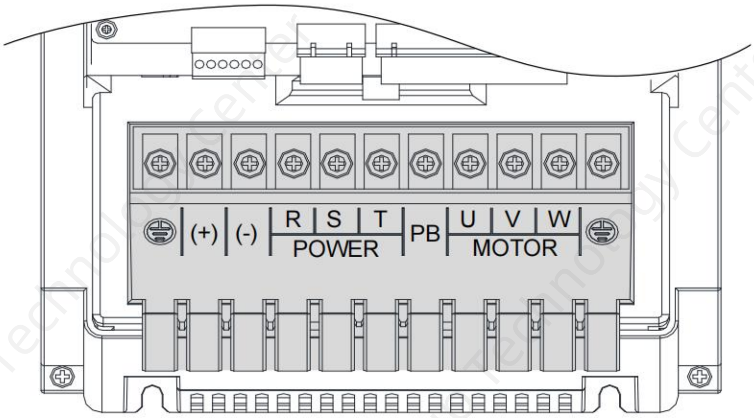
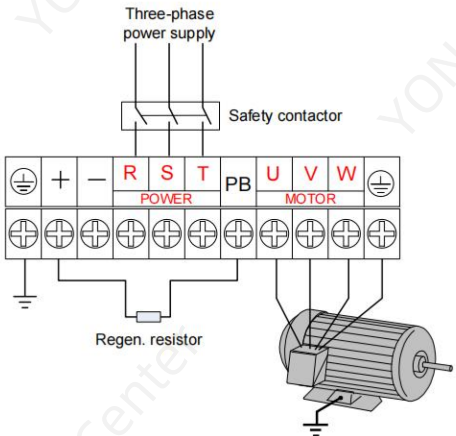


Figure 2-12 Main circuit terminal arrangement

For models of below 37 kW (F model 45 kW)



For models of 37 kW and above (F model 45 kW)

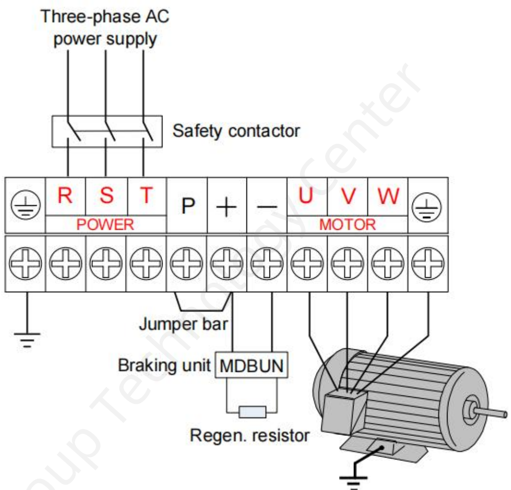


Figure 2-13 Main circuit connection diagram

2 Description of terminals

Table 2-7 Main circuit terminal description

No.	Name	Description
R, S, T	Three-phase power input terminals	Provide three-phase AC power supply.
+, -	Positive and negative terminals of DC bus	Connect the external braking unit and energy feedback unit for models of 37 kW (F model 45 kW) and above.
+, PB(P)	Terminals for connecting regen. resistor	Connect the regen. resistor for models of below 37 kW (F model 45 kW). Connect the DC reactor for models of 37 kW (F model 45 kW) and above. At delivery, the + and P terminals are shorted with the jumper bar. If you need not connect the DC reactor, do not remove the jumper bar.
U, V, W	Controller output terminals	Connecting the three-phase motor
⏚	Grounding terminal	Grounding terminal

3 Wiring

- Power input terminals R, S, T
- The cable connection on the input side of the controller has no phase sequence requirement.
- The specification and installation method of external power cables must comply with the local safety regulations and related IEC standards.
- Use copper conductors of a proper size as power cables according to the recommended values in Table 3-2.
- The cable between the filter and the input terminals must be shorter than 30 cm. Ensure that the grounding terminals of the filter and the controller are connected together, and that both the filter and controller are installed on the same conductive plane that are connected to main grounding of the cabinet.

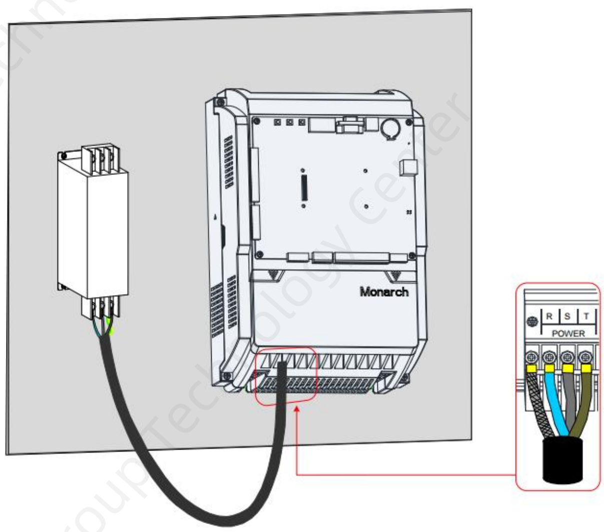


Figure 2-14 Installation on the conductive plane

4 DC bus terminals (+), (-)

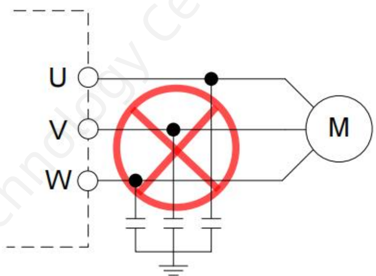
- Terminals (+) and (-) of the DC bus have residual voltage after the controller is switched off. Wait at least 10 minutes and ensure that the voltage is lower than 36 VDC before performing wiring. Failure to comply may result in electric shock.
- When connecting external braking components for the controller of 37 kW and above, never reverse (+) and (-). Failure to comply may result in damage to the controller and even cause a fire.
- The cable length of the braking unit must not exceed 10 m. Use the twisted pair wire or tight pair wires for parallel connection.
- Do not connect the regen. resistor directly to the DC bus. Otherwise, it may damage the controller and even cause a fire.

5 Terminals (+), PB for connecting regen. resistor

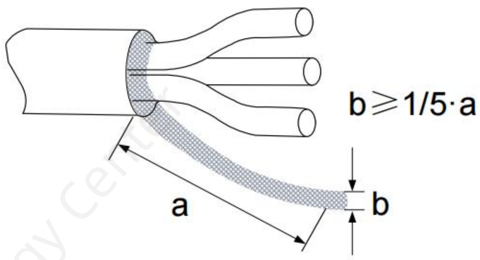
- These terminals are valid only for the models below 37 kW that have the built-in braking unit.
- Connect a regen. resistor of the recommended model, and ensure that the cable length of the regen. resistor is shorter than 5 m. Otherwise, it may damage the controller.

6 Controller output terminals U, V, W

- The specification and installation method of external power cables must comply with the local safety regulations and related IEC standards.
- Use copper conductors of a proper size as power cables according to the recommended values in Table 3-2.
- Do not connect a capacitor or surge absorber to the output side of the controller. Otherwise, it may cause overheating or even damage to the controller due to higher harmonics in the controller output.



- If the motor cable is too long, electrical resonance will be generated due to the impact of distributed capacitance. This will damage the motor insulation or generate higher leakage current, causing the controller to trip in overcurrent protection. If the motor cable is greater than 100 m long, an AC output reactor must be installed close to the controller.
- Use the shielded cable as the output power cables, with the shield connected to the grounding cable.
- The lead-out cable by the shield must be as short as possible, with the width not smaller than 1/5 of the length.



7 Grounding terminal ⏚ (PE)

- The grounding terminal of the main circuit must be tied to the ground reliably with the grounding resistance of the cable smaller than 10 Ω. Otherwise, the controller may be abnormal or damaged.
- Do not connect this terminal ⏚ to the neutral conductor of the power supply.
- The impedance of the PE conductor must be able to withstand the large short circuit current that may arise when a fault occurs.
- Select the size of the PE conductor according to the following table:

Table 2-8 Size of PE conductor

Cross-sectional Area of a Phase Conductor (S)	Min. Cross-sectional Area of Protective Conductor (Sp)
S ≤ 16 mm^2	S
16 mm^2 < S ≤ 35 mm^2	16 mm^2
S > 35 mm^2	S/2

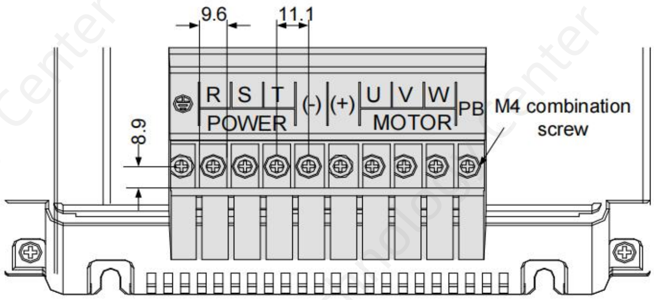
- Use a yellow/green cable as the PE conductor.
- It is recommended that the controller be installed on the conductive metal plane. Ensure that the entire conductive back of the controller is in good contact with the installation plane.
- Install the filter and controller on the same plane to ensure the filtering effect of the filter.

8 Upstream protection device

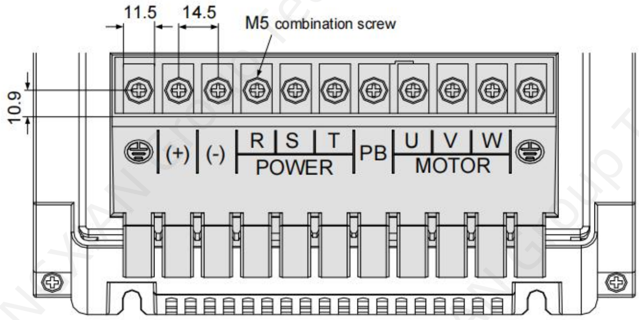
- Install a proper protection device on the power input side to provide protections on overcurrent, short circuit and electrical isolation.
- When selecting the protection device, consider the current capacity of the power cable, system overload capacity and short circuit capacity of upstream power distribution. Generally, make selection according to the recommended values in Table 3-2.

2.2.2 Main Circuit Terminal Arrangement and Size

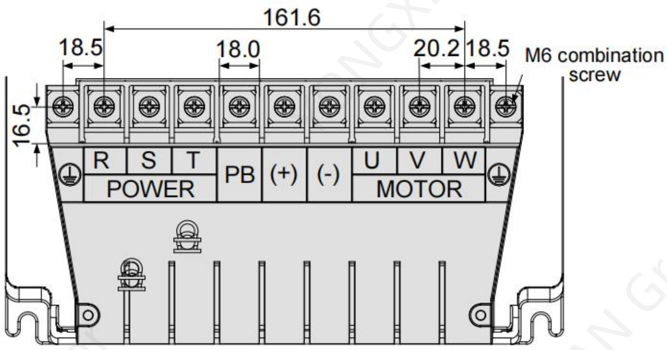
Plastic structure: Size C



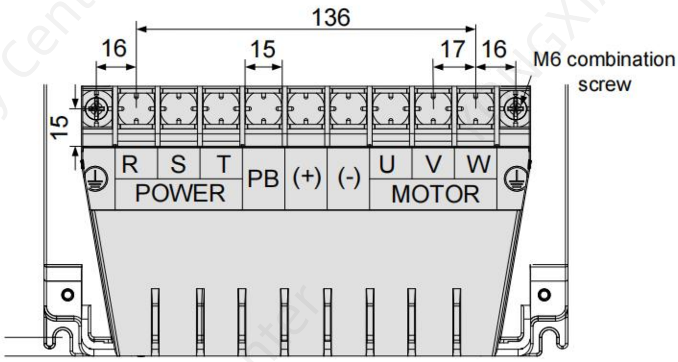
Plastic structure: Size D



Plastic structure: Size E



Plastic structure: Size F



Sheet metal structure: Size E

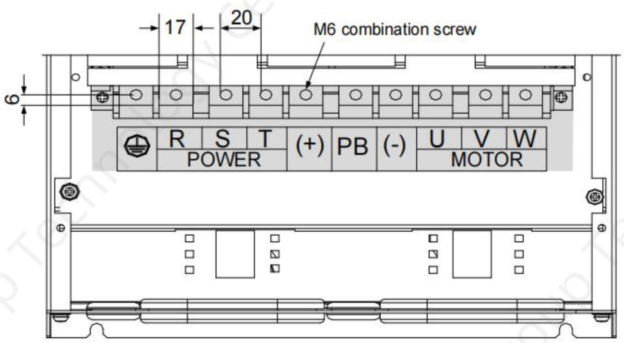


Figure 2-15 Terminal arrangement and size diagrams of Size C/D/E

Table 2-9 NICE-L-C-4002/3/5/7/11/15/22/30 input specifications

Controller Model	Rated Input Current (A)	Recommended I/O Power Cable (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4002	6.5	2.5	1.2	GTNR2.5-4
NICE-L-C-4003	10.5	2.5	1.2	GTNR2.5-4
NICE-L-C-4005	14.8	2.5	1.2	GTNR2.5-4
NICE-L-C-4007	20.5	4	2.5	GTNR4-5
NICE-L-C-4011	29.0	6	2.5	GTNR6-5
NICE-L-C-4015	36.0	6	2.5	GTNR6-5
NICE-L-C-4018	41	10	4.0	GTNR10-6
NICE-L-C-4018F	41	10	4.0	GTNR16-6
NICE-L-C-4022	49.5	10	4.0	GTNR16-6
NICE-L-C-4022F	49.5	10	4.0	GTNR16-6
NICE-L-C-4030	62	16	4.0	GTNR16-6
NICE-L-C-4030F	62	16	4.0	GTNR16-6
NICE-L-C-4037F	62	25	4.0	GTNR16-6

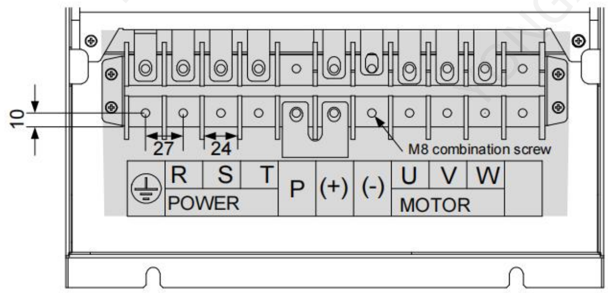


Figure 2-16 Main circuit cable terminal and size diagram of sheet metal structure, Size F

Table 2-10 NICE-L-C-4037/45/55 input specifications

Controller Model	Rated Input Current (A)	Recommended I/O Power Cable (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4037	77	25	10.5	TNR0.75-4
NICE-L-C-4045	93	35	10.5	TNR1.25-4
NICE-L-C-4055	113	50	10.5	GTNR2.5-4

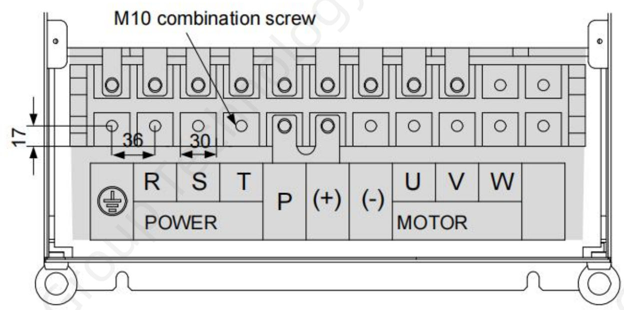


Figure 2-17 Main circuit cable terminal and size diagram of sheet metal structure, Size G

Table 2-11 NICE-L-C-4075/45/95 input specifications

Controller Model	Rated Input Current (A)	Recommended I/O Power Cable (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4075	157.5	70	20	GTNR70-10
NICE-L-C-4090	180	95	20	GTNR95-10

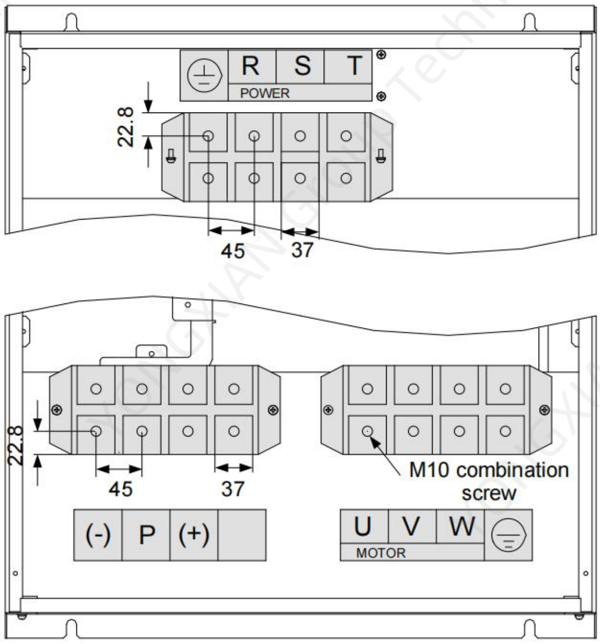


Figure 2-18 Main circuit cable terminal and size diagram of sheet metal structure, Size H

Table 2-12 NICE-L-C-4110/132/160 input specifications

Controller Model	Rated Input Current (A)	Recommended I/O Power Cable (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4110	214	120	35.0	GTNR120-12
NICE-L-C-4132	256	120	35.0	GTNR120-12
NICE-L-C-4160	307	150	35.0	GTNR150-12

The above recommended cable lug models are TNR and GTNR series cable lugs from Suzhou Yuanli Metal Enterprise.

Reference data for recommended lugs (Suzhou Yuanli Metal Enterprise Co., Ltd)

GTNR series

TNR series

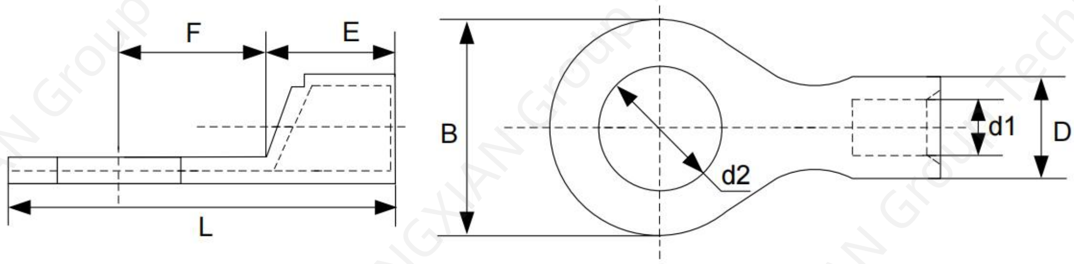


Figure 2-19 Dimensions of TNR series cable lugs

Table 2-13 Model and size of TNR series cable lugs

Model	Cable Range		D	d1	E	F	B	d2	L	Current (A)	Crimping Plier
	AWG/ MCM	mm^2									
TNR0.75-4	22-16	0.25-1.0	2.8	1.3	4.5	6.6	8.0	4.3	15.0	10	RYO-8 AK-1M
TNR1.25-4	22-16	0.25-1.65	3.4	1.7	4.5	7.3	8	5.3	15.8	19	

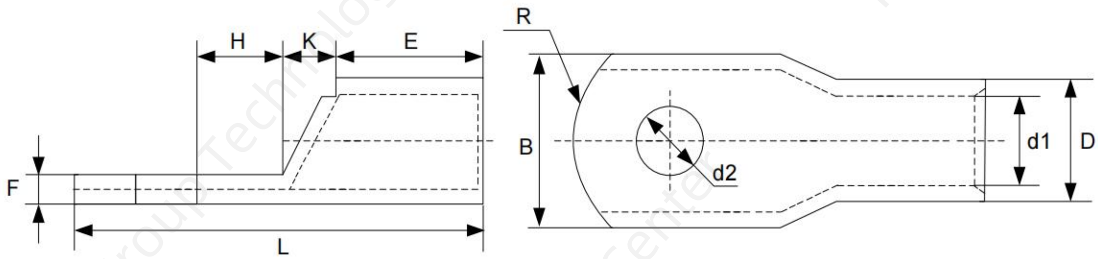


Figure 2-20 Dimensions of GTNR series cable lugs

Table 2-14 Models and dimensions of GTNR series cable lugs (mm)

Model	D	d1	E	H	K	B	d2	F	L	R	Crimping Plier
GTNR1.5-5	4.0	2.2	5.0	5.0	2.0	8.0	5.3	1.0	16.0	5	RYO-8 YYT-8 RYO-14
GTNR2.5-4	4.5	2.9	7.0	5.0	2.0	8.0	4.3	1.0	18.0		
GTNR2.5-5				6.0			5.3		20.0	7	
GTNR2.5-6						10.2	6.4	0.8			
GTNR4-5	5.2	3.6	7.0	6.0	2.0	10.0	5.3	1.0	20.0		
GTNR4-6							6.4				
GTNR6-5	6.0	4.2	9.0	6.0	3.0	10.0	5.3	1.2	23.0		
GTNR6-6				7.5			6.4		26.0		
GTNR6-8						12.0	8.4	1.0			
GTNR10-6	7.0	5.0	9.0	8.0	3.5	12.4	6.4	1.3	26.5		
GTNR10-8							8.4		27.5		
GTNR16-6	7.8	5.8	12.0	8.0	4.0	12.4	6.4	1.3	31.0		CT-38 CT-100
GTNR16-8							8.4				
GTNR25-6	9.5	7.5	12.0	8.0	4.5	14.0	6.4	2.0	32.0	10	
GTNR25-8				9.0		15.5	8.4	1.6	34.0		
GTNR25-10				10.5		17.5	10.5	1.4	37.0		
GTNR35-6	11.4	8.6	15.0	9.0	5.0	15.5	6.4	2.8	38.0		
GTNR35-8							8.4				
GTNR35-10				10.5		17.5	10.5	2.5	40.5		
GTNR50-8	12.6	9.6	16.0	11.0	6.0	18.0	8.4	2.8	43.5		CT-100
GTNR50-10							10.5				
GTNR70-8	15.0	12.0	18.0	13.0	7.0	21.0	8.4	2.8	50.0	14	
GTNR70-10							10.5				
GTNR70-12							13.0				
GTNR95-10	17.4	13.5	20.0	13.0	9.0	25.0	10.5	3.9	55.0		
GTNR95-12							13.0				
GTNR120-12	19.8	15.0	22.0	14.0	10.0	28.0	13.0	4.7	60.0	16	RYC-150
GTNR120-16				16.0			17.0		64.0		
GTNR150-12	21.2	16.5	26.0	16.0	11.0	30.0	13.0	4.7	69.0	24	
GTNR150-16							17.0				
GTNR185-16	23.5	18.5	32.0	17.0	12.0	34.0	17.0	5.0	78.0		
GTNR240-16	26.5	21.5	38.0	20.0	14.0	38.0	17.0	5.5	92.0		
GTNR240-20							21.0				

2.2.3 Description and Wiring of Control Circuit Terminals

1 Terminal Layout

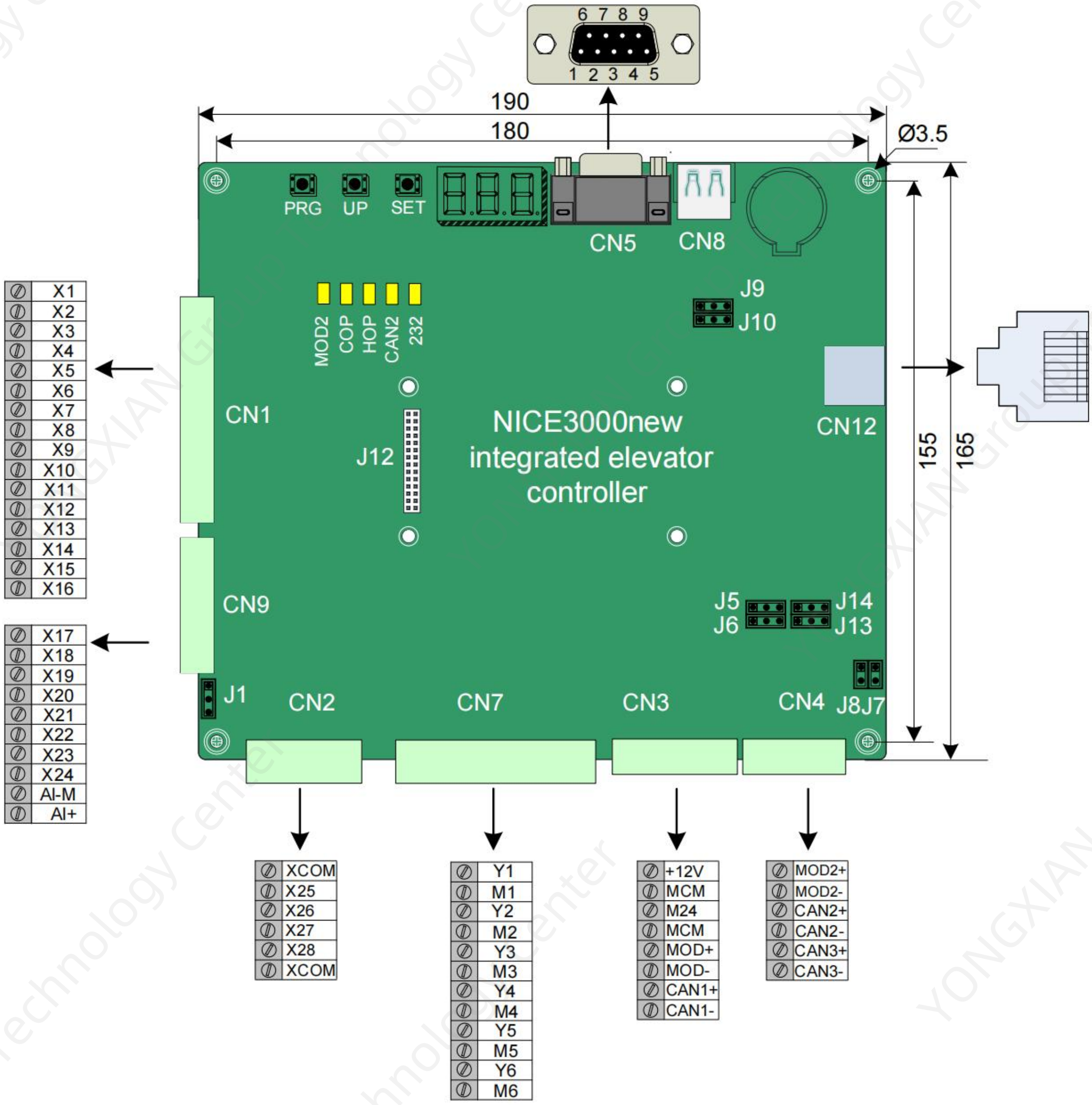
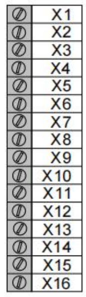
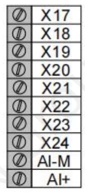
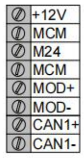
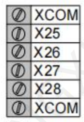
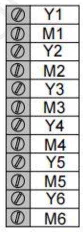
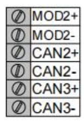


Figure 2-21 Control circuit terminal arrangement (Unit: mm)

2 Description of terminals

Table 2-15 Control circuit terminal description

No.	Code	Terminal Name	Function description	Terminal Arrangement
CN1	X1 to X16	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ Optocoupler isolation Input current limit: 5 mA Functions set in F5-01 to F5-24	 CN1
CN9	X17 to X24	DI		 CN9
	AI-M/AI+	AI	Used for the analog load cell device	
CN3	+12V/MCM	External 12 VDC input	12 VDC power supply emergency	 CN3
	M24V/MCM	External 24 VDC input	24 VDC power supply for the entire board	
	MOD+/-	RS485 differential signal	Standard isolated RS485 communication interface, used for hall call and display	
	CAN1+/-	CANbus differential signal	CANbus communication interface, communication with the CTB; equipment-roomless monitoring board and DI/DO expansion board interface	
CN2	X25 to X28/ XCOM	Higher-voltage detection terminal	Input voltage 110 VAC ± 15%, 110 VDC ± 20% Safety circuit and door lock circuit, function set in F5-37 to F5-40	 CN2
CN7	Y1/M1 to Y6/M6	Relay output	NO contact output: 5 A/250 VAC Function set in F5-26 to F5-31	 CN7
CN8	USB interface	RS232 communication interface	Cell phone bluetooth commissioning interface	 USB
CN4	MOD2+/-	RS485 differential signal	MOD2 communication interface, used for residential monitoring and Internet of Things	 CN4
	CAN2+/-	CAN2 differential signal	CAN2 communication interface, used for parallel/group control	
	CAN3+/-	Reserved		

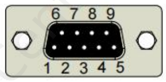
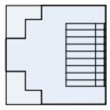
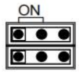
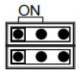
No.	Code	Terminal Name	Function description	Terminal Arrangement
CN5	DB9 interface	RS232 communication interface	Interface for: Site commissioning software Residential monitoring RS232/RS485 parallel/group control Software downloading of the MCB and DSP board	 CN5
CN12	RJ45 interface	Operation panel interface	Used to connect the operation panel	 CN12
J12	Interface for connecting the PG card			 J12
J1	Factory reserved, optional grounding terminal for AI. The pins marked with "COM" are not connected to the ground by default.			 COM J1
J5	Factory reserved, termination resistor connection terminal for the MOD2 communication control board. The pins marked with "ON" are connected to the termination resistor by default.			ON  J5 J6
J6				
J13	Factory reserved, termination resistor connection terminal for the CAN2 communication control board. The pins marked with "ON" are connected to the termination resistor by default.			ON  J14 J13
J14				
J7	Factory reserved, internal 24 V PE terminal, shorted by default			 J8J7
J8	Factory reserved, external 24 V PE terminal, shorted by default			
J9/J10	Factory reserved. Do not short them randomly. Otherwise, the controller may not work properly.			

Table 2-16 Description of indicators on the MCB

No.	Terminal Name	Function description
MOD2	Modbus2 communication indicator	When communication with Internet of Things and MIB/remote monitoring board is normal, this indicator is on (green).
COP	CAN1 communication indicator	When communication between the MCB and the CTB is normal, this indicator is on (green).
HOP	Modbus1 communication indicator	When communication between the MCB and the HCB is normal, this indicator is on (green).
CAN2	Group control communication indicator	This indicator is steady on (green) when communication for parallel/group control is normal, and blinks when the running in parallel/group control mode is normal.
232	Serial communication indicator	This indicator is on (green) when communication with the host computer or MIB/remote monitoring board is normal.
X1 to X24	Low voltage input signal indicator	This indicator is on when the external input is active.
X5 to X28	High voltage input signal indicator	This indicator is on when the external input is active.
Y1 to Y6	Output signal indicator	This indicator is on when the system output is active.

Cable connection

1) Cable selection for control circuit

■ Use copper conductors of a proper size as control cables according to the recommended values in Table 3-2.

2) Cabling requirement of control circuit

■ The motor cables must be laid far away from all control cables.

■ It is recommended that the motor cables, power input cables and control cables be laid in different ducts. To avoid electromagnetic interference caused by rapid change of the output voltage of the controller, the motor cables and control cables must not be laid side by side for a long distance.

■ If the control cable must run across the power cable, make sure they are arranged at an angle of close to 90° .

■ Figure A-6 shows the recommended cabling diagram.

2.2.4 Control Circuit Cable Sizes and Tightening Torque

Tubular terminal:

Use the tubular terminal with the insulation sleeve.

When the single cable or twisted pair is used, the cable end must be exposed by 6 mm.

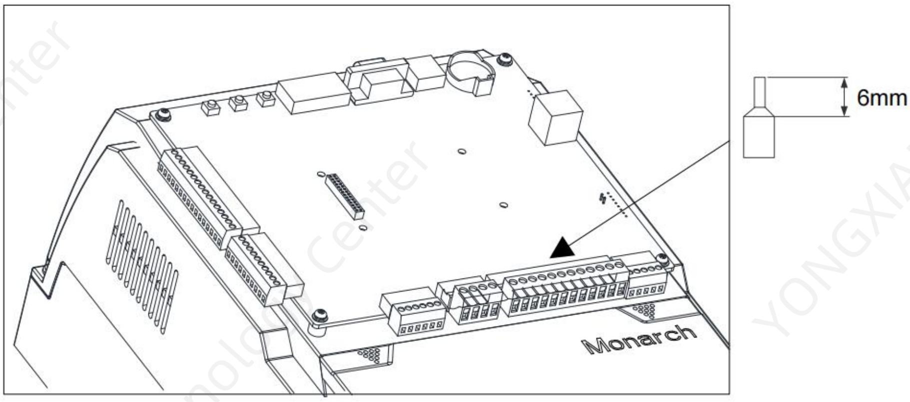


Figure 2-22 Control cable tubular terminal requirement

Table 2-17 Control cable specifications

Terminal Name	Single Cable mm² (AWG)	Twisted Pair mm² (AWG)	Torque of Torque Driver (N·m)
Control circuit terminal block	0.2–0.75 (AWG24–18)		0.565

2.3 Interface and Communication

2.3.1 Digital Input (DI)

Quantity	24
Code	X1 to X24
Function Code	F5-01 to F5-24
Input impedance	4.7 kΩ
Effective voltage	10–30 VDC
Electrical feature	Optocoupler isolation

The 24 DI terminals provides inputs to the MCB in parallel for monitoring the elevator status. All the terminals share the COM ground. After 24 V voltage is input to a terminal, the signal indicator of the terminal becomes ON.

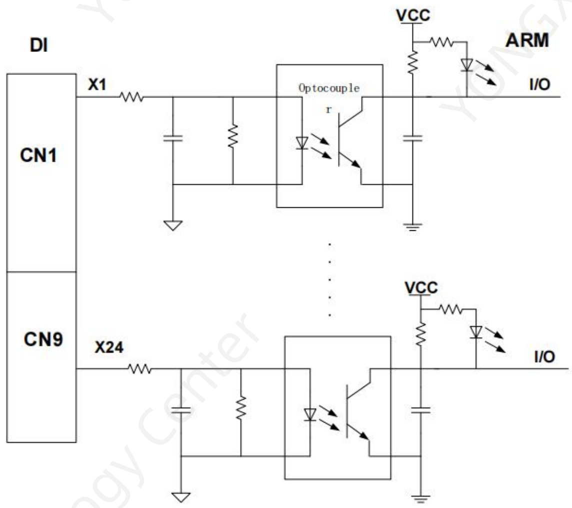


Figure 2-23 DI circuit

2.3.2 Analog Differential Input (AI)

Quantity	2
Code	Ai/M
Input voltage	-10Vdc~10Vdc
Input impedance	33.9 kΩ

The two AI terminals are used for input of the analog load cell. Weak analog voltage signals are easy to suffer external interference, and therefore the shielded cable must be used and the cable length must be less than 20 m. In applications where the analog signal suffers severe interference, install a filter capacitor or ferrite magnetic core at the analog signal source.

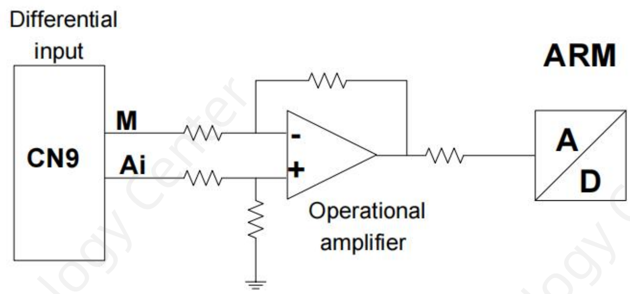


Figure 2-24 Analog differential input circuit

2.3.3 Relay Output (DO)

Relay	Quantity	Code	Function Code
Y1/Y2/Y3	3	Y1/M1 to Y3/M3	F5-26 to F5-28
Y4/Y5/Y6	3	Y4/M4 to Y6/M6	F5-29 to F5-31

Relay characteristics

Relay	Rated load	Maximum current	Response time
Y1/Y2/Y3	5 A 250 VAC/30 VDC	10A	10 ms
Y4/Y5/Y6	5 A 250 VAC/30 VDC	5A	10 ms

A total of six relay outputs are provided. The optocoupler isolated ARM I/O signals control the relay line package current. After the line package is energized, the corresponding signal indicator becomes ON. The relay outputs do not have the common ground.

The inductive load (relay, contactor, and motor) causes voltage peak after the current is removed. A TVS is used for protection at the Y1/M1 to Y3/M3 contacts of the relay, so running, brake and shorting motor stator control must be configured on Y1/M1 to Y3/M3 correspondingly. In addition, XCOM on the high voltage detection terminal CN4 must be connected to the 110 V neutral line of the safety circuit. No absorption circuit needs to be configured at both ends of the external contactor coil.

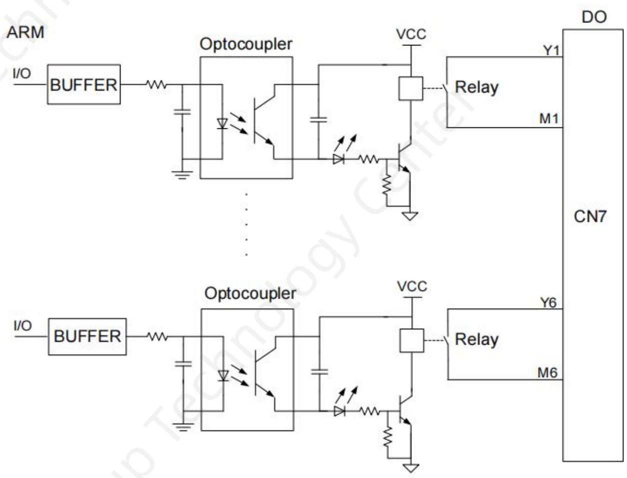


Figure 2-25 Relay output circuit

2.3.4 Modbus Communication

1 Hardware wiring

RS485 hardware connection

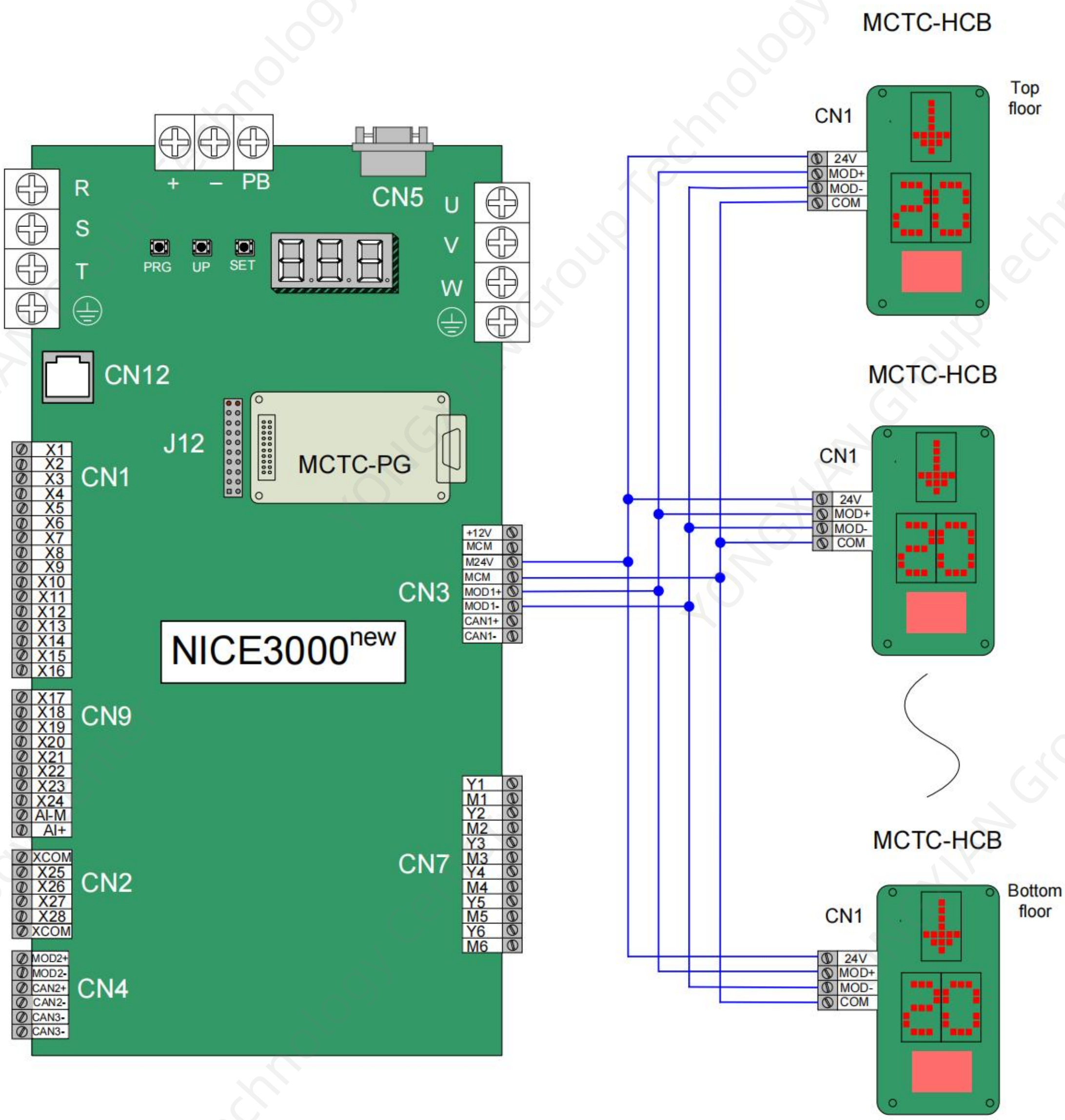


Figure 2-26 RS485 connection between the NICE3000new and the HCB

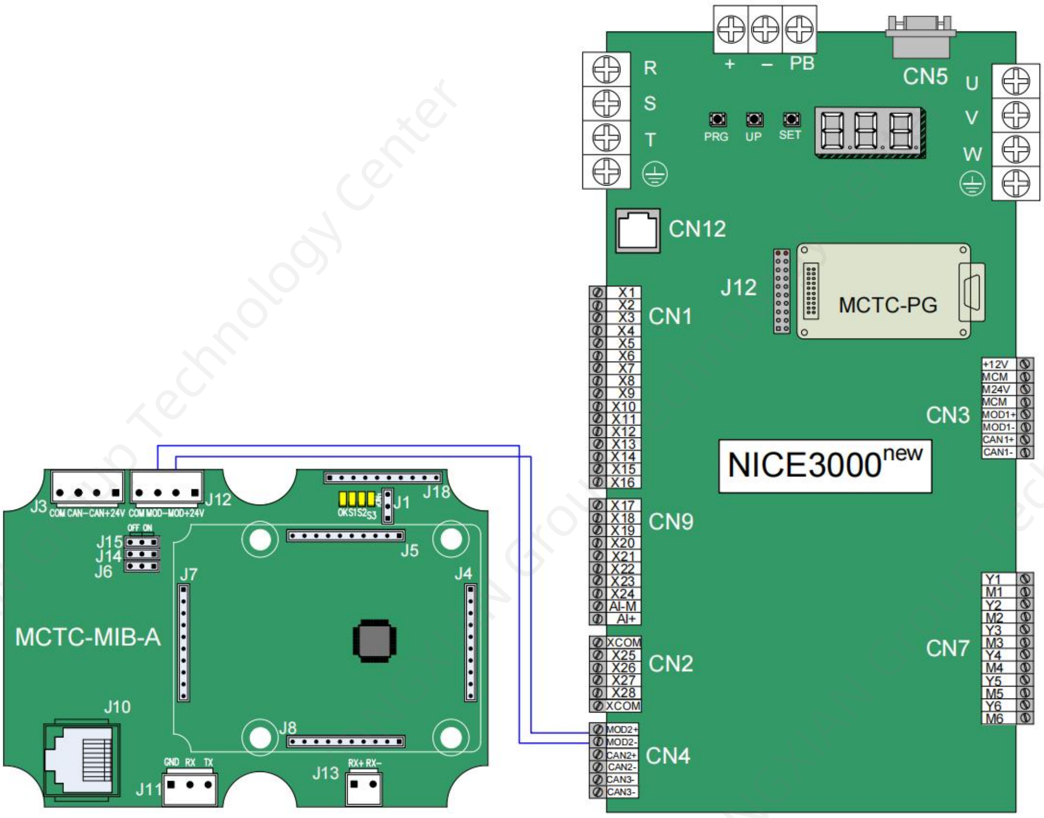


Figure 2-27 Connection between the NICE3000[new] and the MIB

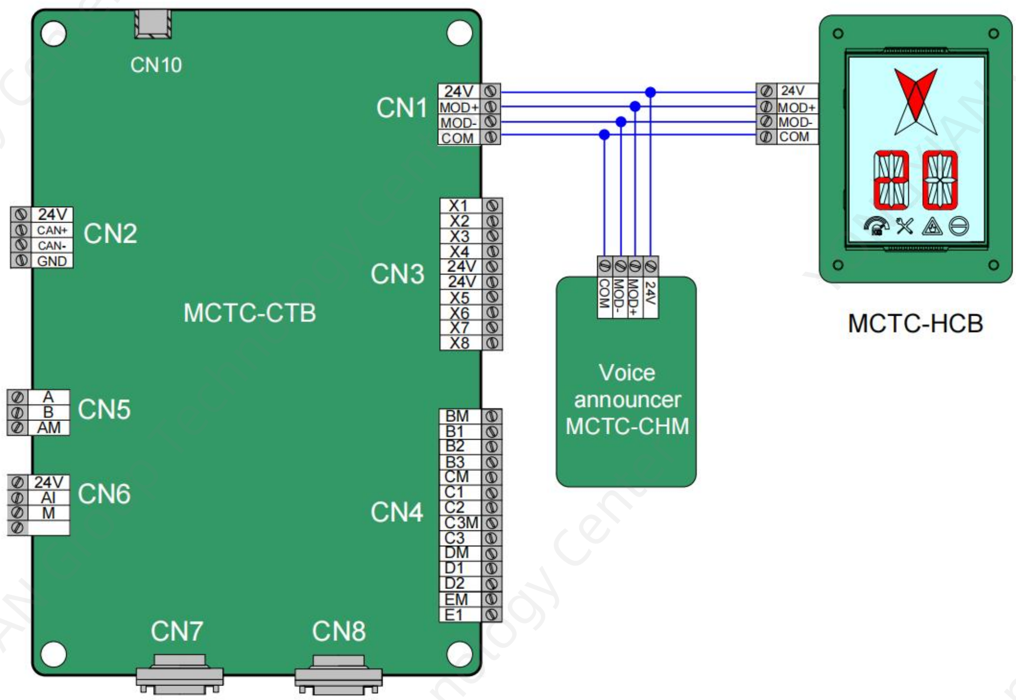


Figure 2-28 RS485 connection between the CTB, car display board, and voice announcer

2 Communication address setting of HCB and car display board

When the MCB is in networking with the HCBs, each HCB must have a unique address; otherwise, communication will be abnormal.

When the CTB is in networking with the car display board and voice announcer, the car display board address is 0. The voice announcer does not need any address setting and can be directly used after being connected. For details on how to set the address of the display board, see the related description in 3.3.3 Display Board (MCTC-HCB).

The address allocation is as follows:

0: Car display board address

1–40: HCB addresses

The MCB exchanges information including the floor and running direction with the CTB by CANbus.

The NICE3000^{new} provides services for a maximum of 40 floors with the standard program (for support of above 40 floors, a customized program is required; for details, contact us).

3 Topology requirement

When there are a large number of nodes, the RS485 bus structure can be in hand-in-hand connection or branch connection. If branch connection is used, the cable length between the bus and a node is as short as possible; the recommended length is shorter than 3 m. The star connection is forbidden. The following figure shows the common bus structure diagram.

■ Hand-in-hand connection structure

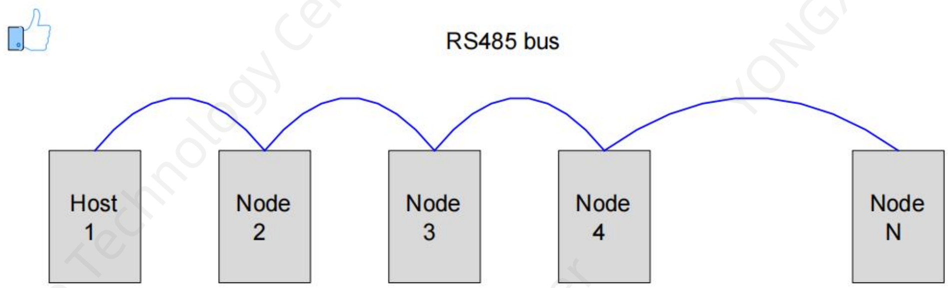


Figure 2-29 Hand-in-hand connection structure

■ Branch connection structure

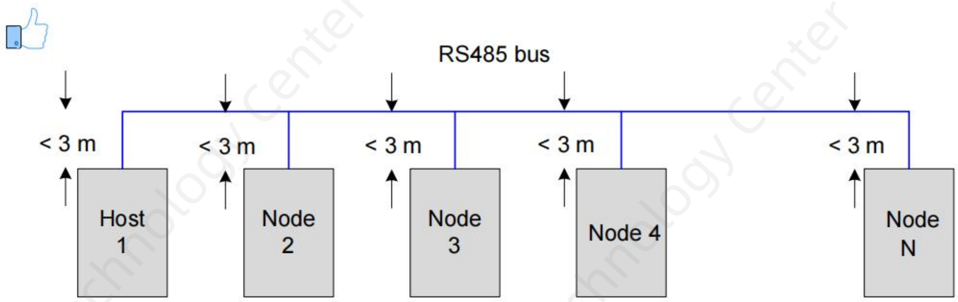


Figure 2-30 Branch connection structure

■ Wrong structure: star connection structure

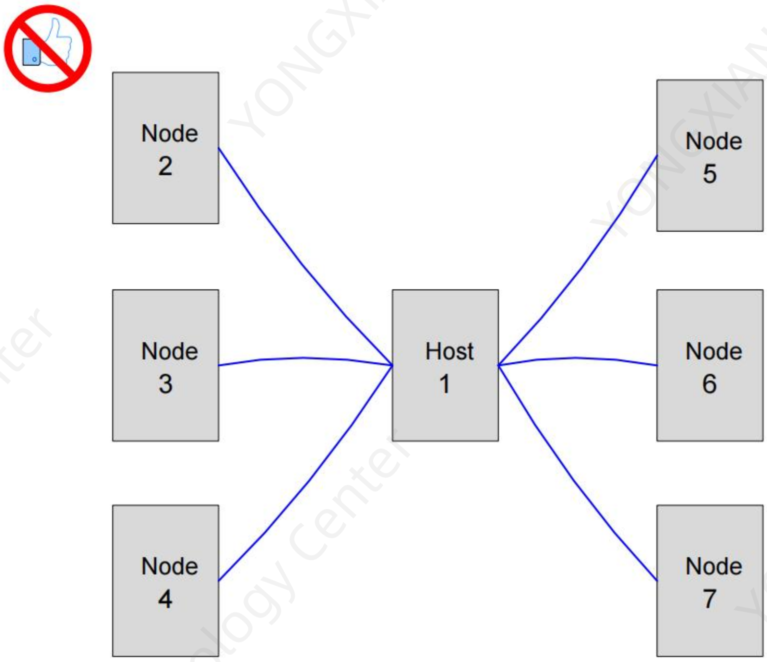


Figure 2-31 Star connection structure (wrong)

4 EMC precautions

Use the twisted pair as the RS485 communication cable.

Separate the RS485 bus from other interfering cables during cabling.

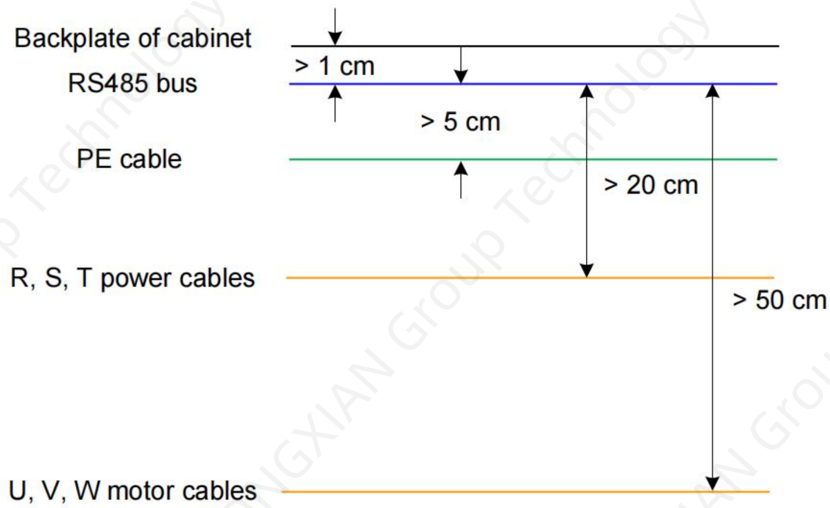


Figure 2-32 RS485 cabling diagram

NOTE

- The distance between the RS485 bus and strong-current cables must be larger than 20 cm.
- The distance between the RS485 bus and U, V, W motor cables must be larger than 50 cm.
- The distance between the RS485 bus and grounding cable must be larger than 5 cm.
- The distance between the RS485 bus and the backplane of the control cabinet must be larger than 1 cm.

5. Problems and Handling

1) Problem 1: Problem 1: Termination resistor connection

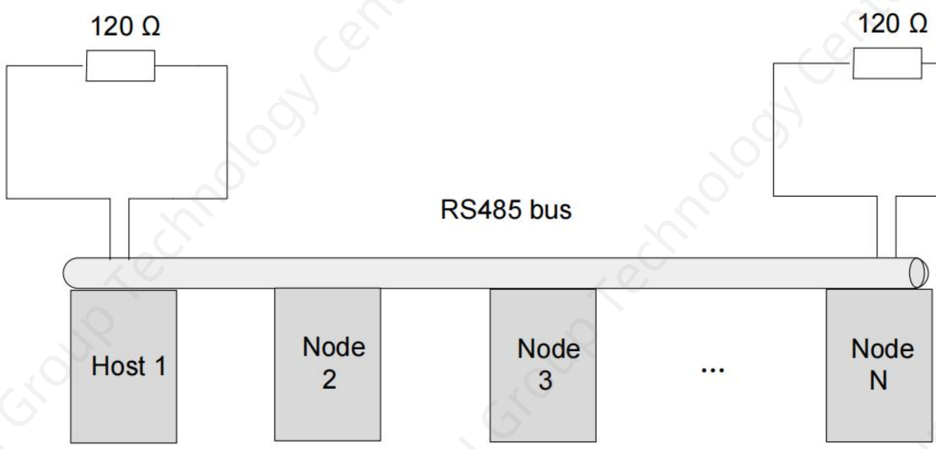


Figure 2-33 Correct termination resistor connection diagram

NOTE

- The termination resistor can be connected only at two ends of the bus.
- When the resistance of the RS485 bus measured by the multimeter is about 60 Ω (all devices must power off during measurement), the bus is normal.
  If the measured resistance is lower than 50 Ω, check two ends of the bus, and check whether another resistor is added; if yes, disconnect this one.
  If the measured resistance is 0 Ω, check whether short circuit exists or a node is damaged.

2) Problem 2: Problem 2: Suppressing interference from external system

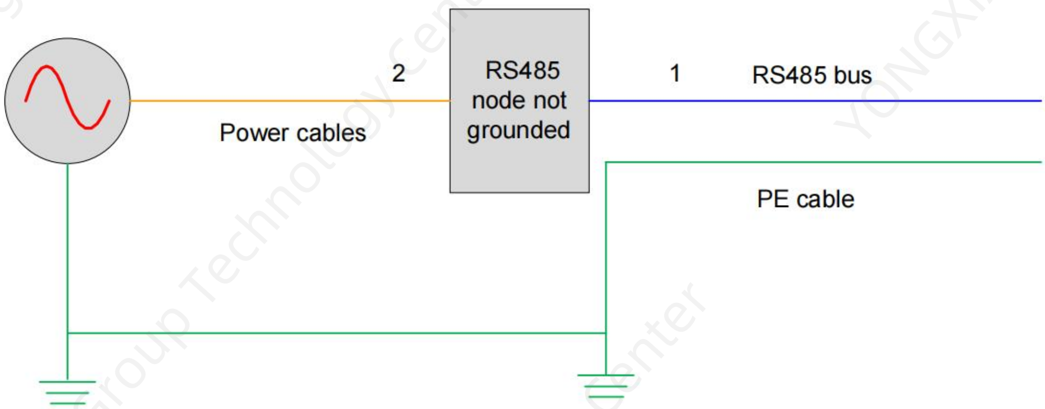


Figure 2-34 Suppressing external interference

Handling method:

- The measures of suppressing external interference are as follows: 1. The recommended method is to add the magnetic ring at position 1, which can effectively suppress external interference.
- Adding the magnetic ring at position 2 can also suppress external interference.

3) Problem 3: Suppressing interference from the controller

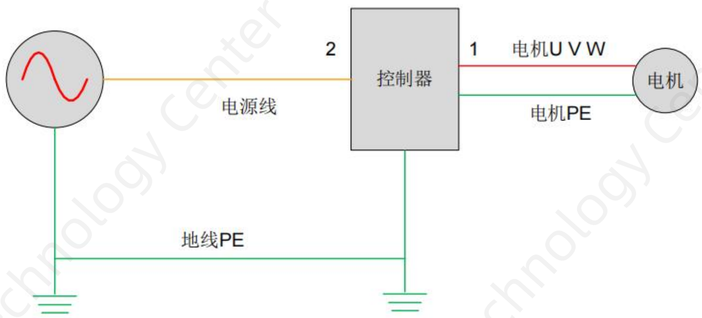


Figure 2-35 Suppressing interference from the controller

Handling method:

- The recommended method is to add the filter magnetic ring at position 1, with the U, V, W cables (not including the PE cable) passing through the magnetic ring and winding three coils. This method has the best effect.
- 2. The second method is to add the filter magnetic ring at position 2, with the U, V, W cables (not including the PE cable) passing through the magnetic ring and winding three coils.

2.3.5 CAN Communication

1 Hardware wiring

- CAN hardware connection

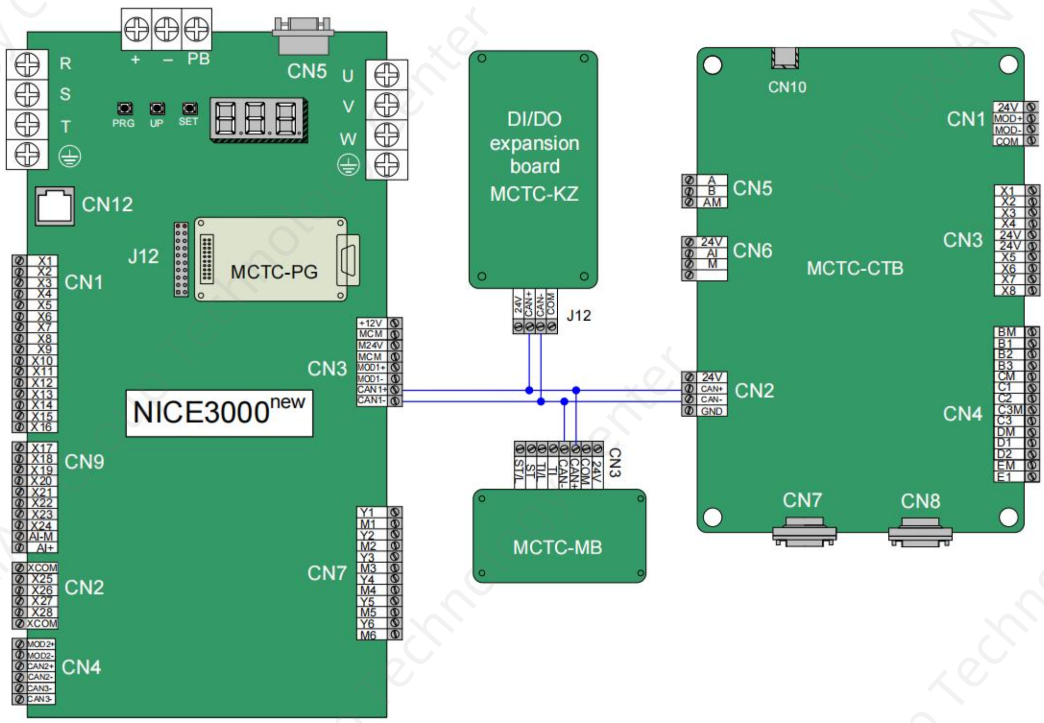


Figure 2-36 CAN connection between the NICE3000new and the CTB, DI/DO expansion board and equipment-roomless monitoring board

2 EMC precautions

Before power-on, check whether there is short circuit between the 24 V, COM, CAN+, CAN- cables and other cables.

Ensure that the communication cable is separated from the power cables. If the strong-current cables and weak-current cables are laid in parallel, the strong-current cables are laid at a side, and the weak-current cables are laid at another side; a grounding cable is used to separate them.

The traveling cable must be grounded.

Use a four-core cable as the communication cable, with one core connected to 24 VDC, two cores connected to CAN+ and CAN-, and the other core connected to COM.

In the case of high rate and long distance transmission, the shielded cable is not recommended because it has long transmission delay. The transmission distance has little relation to the cable diameter.

3 Typical site problems on CAN communication and handling

1) Problem 1: Check whether the termination resistor is connected correctly.

Power off all devices, and measure the resistance between CAN+ and CAN- at either side of the CAN network by using a multimeter. The normal value is about 60 Ω. If the value is too small, an unnecessary resistor is connected besides the termination resistors at two ends. In this case, you need to disconnect this unnecessary resistor.

2) Problem 2: Check the communication cable.

The communication cable must be twisted pair with metal shield. The cable sectional area is 0.75 mm^2 at minimum. All common terminals COM are connected together (not connect to the system grounding cables). The power supply of all the nodes must be grounded reliably.

3) Problem 3: Check with us whether the protocol is customized special protocol.

Check with us whether the protocol is customized special protocol.

2.4 Installation of Shaft Position Signals

In elevator control, to implement accurate landing and safe running, the car position needs to be identified based on shaft position signals. These shaft position signals include the leveling switches, up/down slow-down switches, up/down limit switches, and up/down final limit switches. These shaft position signals are directly transmitted by the shaft cables to the MCB of the controller.

The following figure shows the arrangement of shaft position signals in the shaft.

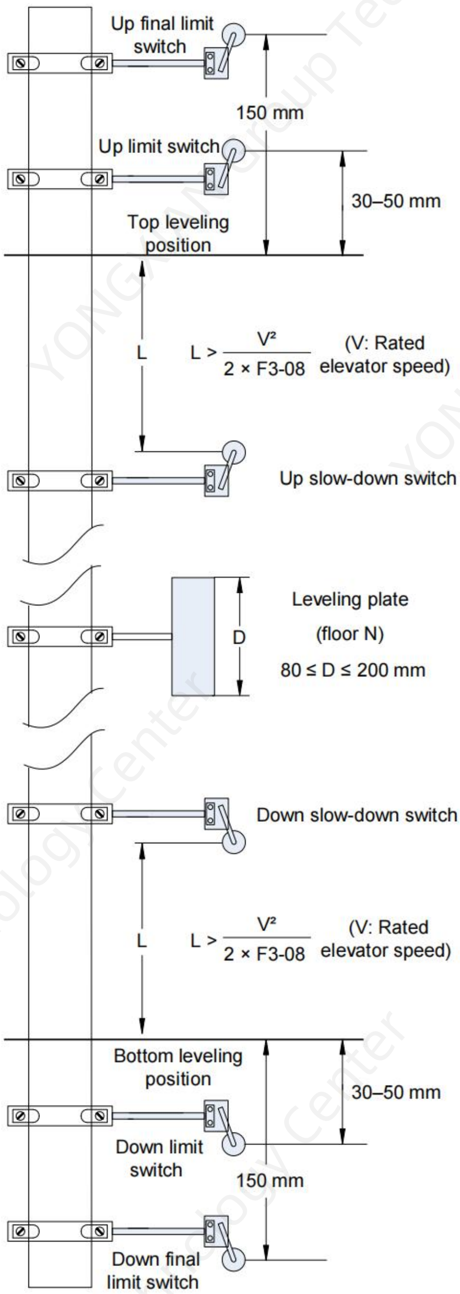


Figure 2-37 Arrangement of shaft position signals

2.4.1 Leveling Signals

Leveling signals comprise the leveling switch and leveling plate and are directly connected to the input terminal of the controller. It is used to enable the car to land at each floor accurately.

The leveling switches are generally installed on the top of the car. The NICE3000[new] system supports the installation of 4 leveling switches. The leveling plate is installed on the guide rail in the shaft. A leveling plate needs to be installed at each floor. Ensure that leveling plates at all floors are mounted with the same depth and verticality.

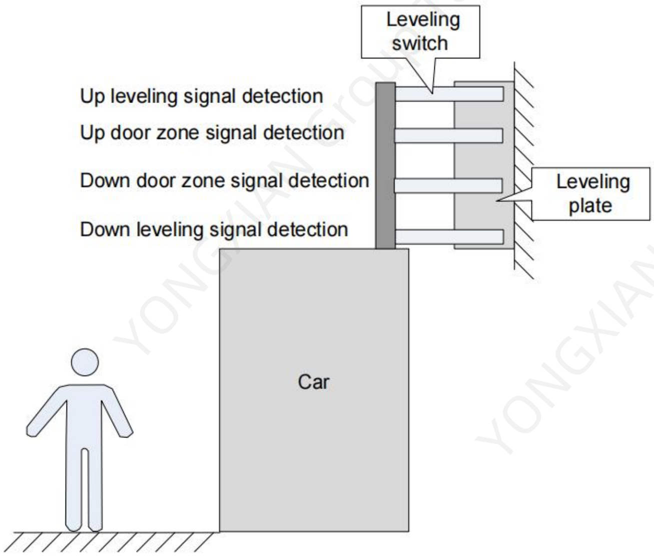
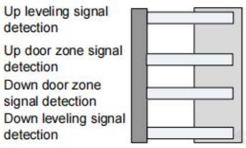
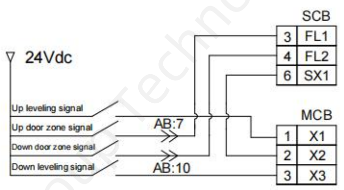
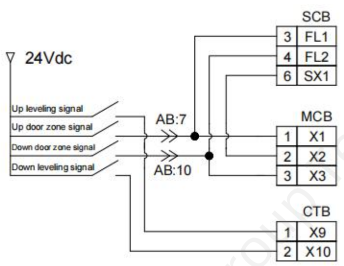


Figure 2-38 Installation of leveling signals

Table 2-18 Installation requirements of leveling switches

Installation Method	Connecting to Input Terminals of Controller	Parameter Setting	State Monitoring
		F5-01 = 1 F5-02 = 3 F5-03 = 2 (CTB analog input) F6-52 Bit6 = 0 (Closed)	FA-26 Bit1: Up leveling state monitoring FA-26 Bit2: Down leveling state monitoring FA-26 Bit3: Door zone signal monitoring
		F5-01 = 1 F5-02 = 3 F5-03 = 2 (CTB analog input) F6-52 Bit6 = 1 (Open) F5-25 Bit9 = 1 (NO) F5-25 Bit10 = 1 (NO)	FA-33 Bit10: Up leveling state monitoring FA-33 Bit11: Down leveling state monitoring FA-26 Bit3: Door zone signal monitoring FA-26 Bit1: Upper door zone signal monitoring FA-26 Bit2: Lower door zone signal monitoring

2.4.2 Slow-Down Switches

The slow-down switch is one of the key protective means of the elevator, protecting the elevator from over travel top terminal or over travel bottom terminal at maximum speed when the elevator position becomes abnormal. The NICE3000^{new} system supports a maximum of three pairs of slow-down switches. The slow-down switch 1, slow-down switch 2 and slow-down switch 3 are installed from the two ends of the shaft to the middle floor one by one. Generally, only one pair of slow-down switches is required for the low-speed elevator. Two or three pairs of slow-down switches are required for the high-speed elevator.

The slow-down distance L indicates the distance from the slow-down switch to the leveling plate at the terminal floor. The calculating formula is as follows:

$$L > \frac{V^2}{2 \times F3\text{-}08}$$

In the formula, "L" indicates the slow-down distance, "V" indicates the F0-04 (Rated elevator speed), and "F3-08" indicates the special deceleration rate.

The default value of F3-08 (Special deceleration rate) is 0.9 m/s^2. The slow-down distances calculated based on different rated elevator speeds are listed in the following table:

Table 2-19 Slow-down distances based on different elevator rated speeds

Rated Elevator Speed (m/s)	0.25	0.4	0.5	0.63	0.75	1	1.5	1.6	1.75	2	2.5	3	3.5	4
Distance of Slow-down 1 (m)	0.4	0.4	0.4	0.4	0.4	0.7	1.5	1.7	2.0	2.0	2.0	2.0	2.0	2.0
Distance of Slow-down 2 (m)	None	None	None	None	None	None	None	None	None	2.5	4.0	4.0	4.0	4.0
Distance of Slow-down 3 (m)	None	None	None	None	None	None	None	None	None	None	None	6	8	11

"V" indicates the elevator speed, and precautions on the actual installation distance are as follows:

- ◆ V < 1 m/s: The actual installation distances of the slow-down switches should be close to the values recommended in this table.
- ◆ 1 m/s ⩽ V ⩽ 2 m/s: The actual installation distances of the slow-down switches are allowed to have an error within ±0.1 m based on the values recommended in this table.
- ◆ 2 m/s < V ⩽ 4 m/s: The actual installation distances of the slow-down switches are allowed to have an error within ±0.3 m based on the values recommended in this table.

NOTE

- ◆ The slow-down distances above are calculated on the basis of the default special deceleration rate 0.9 m/s^2.
- ◆ Decreasing the acceleration rate and deceleration rate and increasing the special deceleration rate does not affect safety. However, decreasing the special deceleration rate may bring safety hazard. If any change is in need, re-calculate the slow-down distance by using the above formula.

2.4.3 Limit Switches

The up limit switch and down limit switch protect the elevator from over travel top/bottom terminal when the elevator does not stop at the leveling position of the terminal floor.

- The up limit switch needs to be installed 30 — 50 mm away from the top leveling position. The limit switch acts when the car continues to run upward 30 — 50 mm from the top leveling position.
- The down limit switch needs to be installed 30 — 50 mm away from the bottom leveling position. The limit switch acts when the car continues to run downward 30 — 50 mm from the bottom leveling position.

2.4.4 Final Limit Switches

The final limit switch is to protect the elevator from over travel top/bottom terminal when the elevator does not stop completely upon passing the up/down limit switch.

- The up final limit switch is mounted above the up limit switch. It is usually 150 mm away from the top leveling position.
- The down final limit switch is mounted below the down limit switch. It is usually 150 mm away from the bottom leveling position.

2.5 Standard Wiring of the System

2.5.1 Wiring Diagram

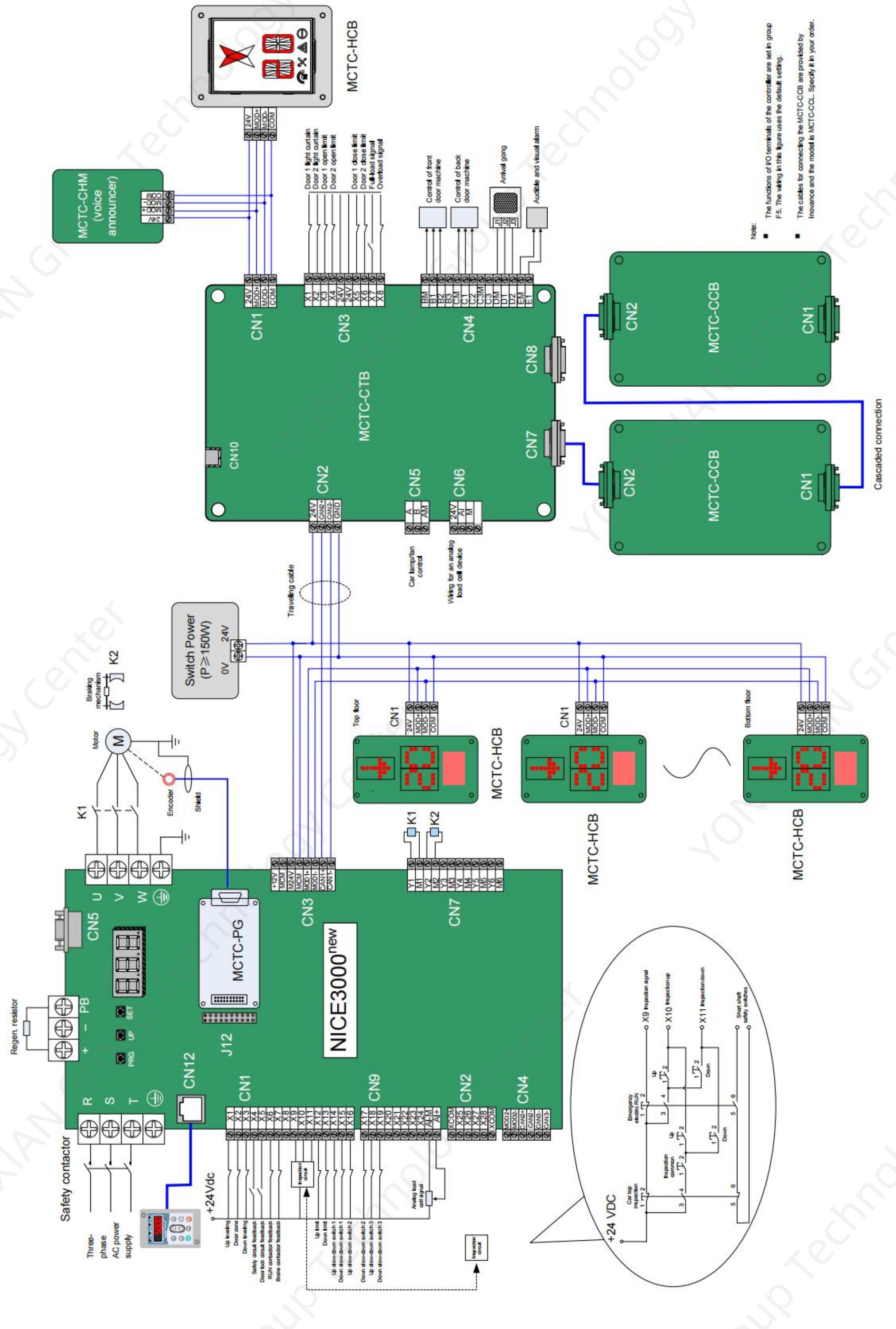


Figure 2-39 Standard wiring diagram of the NICE3000^{new} system

2.5.2 Wiring Inspection

Table 2-20 Wiring checklist

□√	No.	Contents
□	1	Check the controller model to ensure receipt of correct model.
□	2	The peripheral devices (braking components, AC reactor, filter, and circuit breaker) meet the design requirements.
□	3	Check the optional board models to ensure receipt of correct model.
□	4	The installation method and environment of the controller meet the requirements.
□	5	Test that the input voltage is within 380–440 V.
□	6	The rated motor voltage is consistent with the output ratings of the controller.
□	7	Wire the power input cables to R, S, T terminals of the controller correctly.
□	8	Wire motor cables to U, V, W terminals of the controller correctly.
□	9	The cable size of the main circuit meets the requirements.
□	10	Check whether the motor cables exceed 50 m. If yes, decrease the carrier frequency set in F0-07.
□	11	Check whether the grounding cable is grounded properly.
□	12	The output terminals and control circuit terminals are wired securely.
□	13	Check correct wiring of the braking components and proper resistance of the regen. resistor.
□	14	The control circuit signal cables use the shielded twisted pair.
□	15	The optional boards are wired correctly.
□	16	The control circuit cables are separated from the main circuit cables during cabling.

2.5.3 Parameter setting

Figure 2-37 shows the wiring of the NICE3000^{new} system. The functions of I/O terminals of the controller are set using parameters in group F5. The connection method shown in the figure uses the default parameter values. For details, refer to the following table.

Table 2-21 Parameter setting

Function Code	Name	Setting Range	Value
F5-01	X1 function selection	01/33: Up leveling signal NO/NC 03/35: Door zone signal NO/NC 02/34: Down leveling signal NO/NC 04/36: Safety circuit feedback NO/NC 05/37: Door lock circuit feedback NO/NC 06/38: RUN contactor feedback NO/NC 07/39: Brake contactor feedback NO/NC 22/54: Shorting door lock circuit contactor feedback NO/NC 08/40: Inspection signal NO/NC 09/41: Inspection/emergency drive up signal NO/NC 10/42: Inspection/emergency drive down signal NO/NC 84/116: Emergency drive signal NO/NC 12/44: Up limit signal NO/NC 13/45: Down limit signal NO/NC 16/48: Up slow-down 1 signal NO/NC 17/49: Down slow-down 1 signal NO/NC 18/50: Up slow-down 2 signal NO/NC 19/51: Down slow-down 2 signal NO/NC Others: 00: Invalid 11/43: Fire emergency signal NO/NC 14/46: Overload signal NO/NC 15/47: Full-load signal NO/NC 20/52: Up slow-down 3 signal NO/NC 21/53: Down slow-down 3 signal NO/NC 22/54: Shorting door lock circuit contactor feedback NO/NC 23/55: Firefighter running signal NO/NC 24/56: Door machine 1 light curtain signal NO/NC 25/57: Door machine 2 light curtain signal NO/NC 26/58: Brake travel switch 1 NO/NC 27/59: Emergency evacuation signal NO/NC 28/60: Elevator lock signal NO/NC 29/61: Safety circuit 2 feedback NO/NC 30/62: Shorting PMSM stator feedback NO/NC 31/63: Door lock circuit 2 feedback NO/NC 32/64: Reserved 65/97: Door machine 1 safety edge signal NO/NC 66/98: Door machine 2 safety edge signal NO/NC 67/99: Motor overheat signal NO/NC 68/100: Earthquake signal NO/NC 69/101: Back door forbidden signal NO/NC 70/102: Light-load signal NO/NC 71/103: Half-load signal NO/NC 72/104: Fire emergency floor switchover signal NO/NC 76/108: Door 1 open input NO/NC 77/109: Door 2 open input NO/NC 78/110: Brake travel switch 2 input NO/NC 79/111: External fault input 80/112: Terminal floor signal 81/113: Door lock 1 shorting 82/114: Door lock 2 shorting 86/118: Door lock bypass input 88/120： Wire holder feedback signal input NO/NC Note: For the same signal, NC setting parameter = NO setting parameter + 32	33
F5-02	X2 function selection		35
F5-03	X3 function selection		34
F5-04	X4 function selection		4
F5-05	X5 function selection		5
F5-06	X6 function selection		38
F5-07	X7 function selection		39
F5-08	X8 function selection		22
F5-09	X9 function selection		40
F5-10	X10 function selection		09
F5-11	X11 function selection		10
F5-12	X12 function selection		44
F5-13	X13 function selection		45
F5-14	X14 function selection		48
F5-15	X15 function selection		49
F5-16	X16 function selection		50
F5-17	X17 function selection		51
F5-18	X18 function selection		00
F5-19	X19 function selection		00
F5-20	X20 function selection		00
F5-21	X21 function selection		00
F5-22	X22 function selection		00
F5-23	X23 function selection		00
F5-24	X24 function selection		00

Function Code	Name	Setting Range	Value
F5-26	Y1 function selection	1: RUN contactor 2: Brake contactor 3: Shorting door lock circuit contactor 4: Fire emergency floor arrival signal feedback Others: 0: Invalid 5: Door machine 1 open 6: Door machine 1 close 7: Door machine 2 open 8: Door machine 2 close 9: Brake and RUN contactors healthy 10: Fault status 11: Operation status 12: Shorting motor stator contactor 13: Evacuation automatic switchover 14: Normal state of integration 15: Evacuation buzz 16: Brake strong shock 17: Up signal 18: Fan operation 19: Medical sterilization control 20: Non-door zone stop output 21: Electric lock control 22: Non-service state 23: Emergency evacuation completed 25: Wire holder reset 26: Braking pipe short circuit output 27: Alarm filter output	1
F5-27	Y2 function selection		2
F5-28	Y3 function selection		3
F5-29	Y4 function selection		4
F5-30	Y5 function selection		0
F5-31	Y6 function selection		0

3 Peripheral Devices and Options

Safety Information
Warning To Prevent Overheating and Fire ◆ When installing the controller inside the enclosed cabinet, use the cooling fan or air conditioner to keep the air inlet temperature below 50°C.
Danger To Prevent Electric Shock ◆ Never wire the controller while the power is on. Always keep the circuit breaker in OFF state.
Caution To Prevent Damage to the Equipment ◆ Cover the top of the controller with a temporary cloth or paper during installation so as to prevent foreign matter such as metal shavings, oil and water from falling into the controller. ◆ After the installation is completed, remove the temporary cloth or paper. ◆ Follow the proper electrostatic discharge (ESD) procedures when operating the controller. Failure to comply will damage the internal circuit of the controller. ◆ Low-speed motor running reduces the cooling effect and increases the motor temperature, which will result in damage to the motor. ◆ The motor speed range differs with the lubrication mode and the motor manufacturer. When operating the motor out of the speed range, contact the motor manufacturer. ◆ The torque characteristic is different with controller operation compared with operation by commercial power supply. Please check the load torque characteristic of the connected machine. ◆ Pay attention to the load torque characteristic when selecting the controller capacity. In addition, when the distance between the motor and the controller is long, use a cable thick enough to connect the motor and the controller to prevent motor torque reduction. ◆ The rated current of a pole-changing motor differs from that of a standard motor. ◆ Please confirm the maximum current of the motor and select a corresponding controller. Always switch the motor poles after the motor is stopped. ◆ Never lift the controller while the front cover is removed. Failure to comply may result in damage to the PCB and terminal block.

3.1 Peripheral Devices

3.1.1 Peripheral Device Connection

The peripheral devices need to be installed on the input and output sides of the controller to guarantee system safety and reliability. The following figure shows the recommended peripheral device connection diagram..

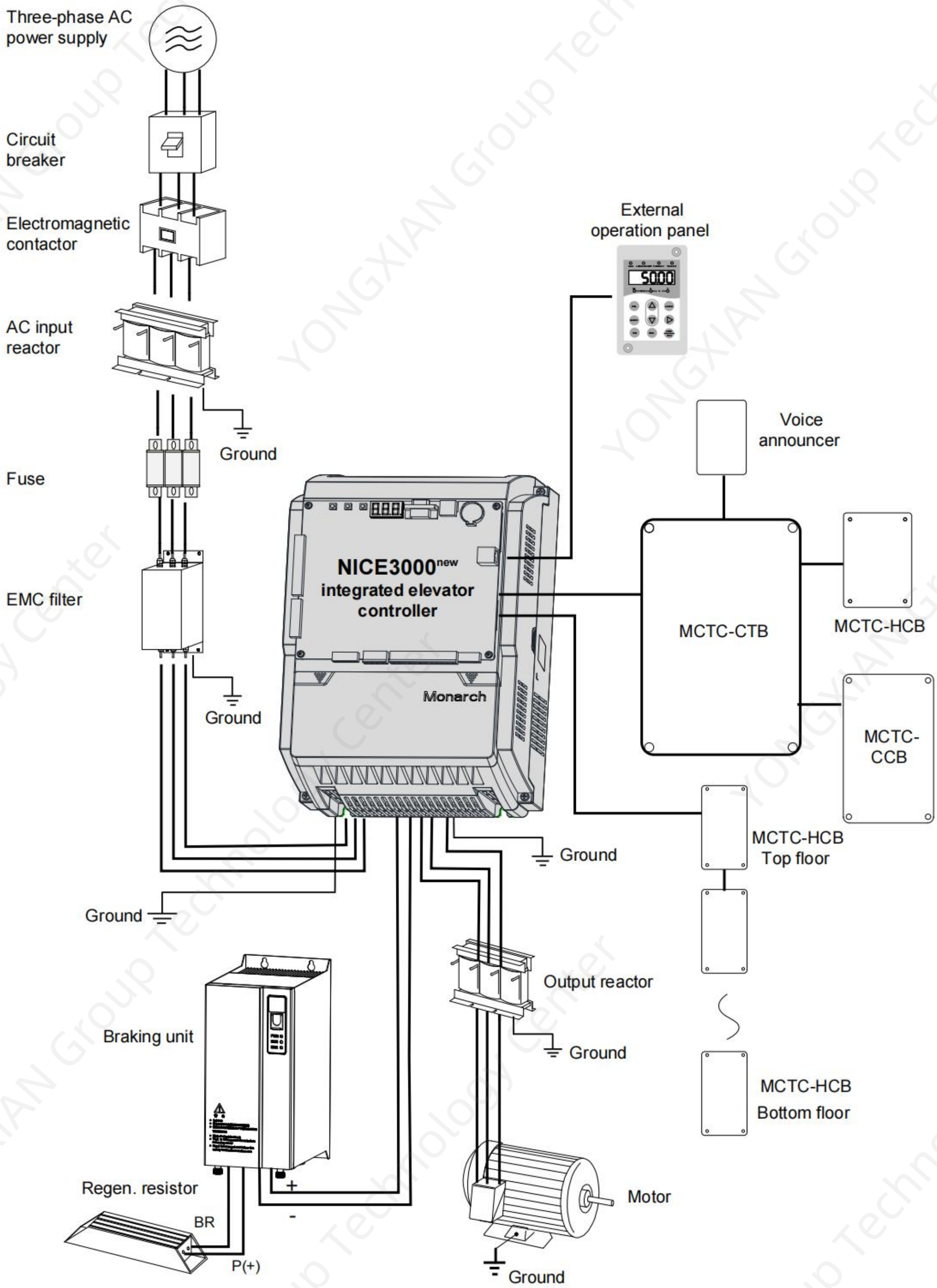


Figure 3-1 Peripheral device connection diagram

3.1.2 Peripheral Device Descriptions

Table 3-1 Peripheral device descriptions

Peripheral Device	Mounting Position	Function description
Circuit breaker	Between power supply and controller input side	Short circuit circuit breaker: Cut off power supply when overcurrent occurs on downstream devices.
		Earth leakage circuit breaker (ELCB): Provide protection against potentially leakage current during controller running to prevent electric shock and even a fire.
Electromagnetic contactor	Between air switch and controller input side	Apply/Cut off the power supply of the controller. Do not start and stop the controller frequently by opening or closing the contactor (less than twice per minute) nor use it to directly start the controller.
AC reactor	Controller input side	Improve the power factor of the input side. Eliminate the higher harmonics of the input side effectively and prevent other devices from being damaged due to distortion of the voltage waveform. Eliminate the input current unbalance due to power supply inter-phase unbalance.
Fuse	Between power supply and controller input side	Provide protection against short circuit.
EMC filter	Controller input side	Reduce conduction and radiation interference generated by the controller. Decrease conduction interference flowing from the power supply to the controller and improve the anti-interference capacity of the controller.
Regen. resistor	Below 37 kW (F model 45 kW)	Directly use the regen. resistor for models below 37 kW. Consume regenerative energy during motor deceleration.
Braking Unit	37 kW (F model 45 kW) and above	Use Inovance braking unit MDBUN and recommended regen. Resistor for models of 37 kW and above. Consume regenerative energy during motor deceleration.
Output reactor	Between controller output side and the motor, close to the controller	There are generally a lot of higher harmonics on the controller output side. When the motor is far from the controller, a subharmonic may generate resonance in the circuit due to large distributed capacitance in the line, having the following adverse effects: Degrade the motor insulation performance and damage the motor in the long run. Generate large leakage current and cause frequent controller protection trips. If the distance between the controller and the motor is greater than 100 m, install an AC output reactor.
dv/dt reactor	On the controller output side, close to the controller	Provide motor insulation protection and reduce the bearing current.
Common-mode filter	On the controller output side, close to the controller	Reduce the bearing current.
Motor	Controller output side	Select an appropriate motor according to the recommendation.

Peripheral Device	Mounting Position	Function description
DC reactor	37 kW (F model 45 kW) and above DC reactor It is standard configuration for 37 kW (F model 45 kW) and above.	Improve the power factor of the input side. Improve efficiency and thermal stability of the controller. Eliminate the impact of input side higher harmonics on the controller and reduce conduction and radiation interference generated by the controller.

Precautions for peripheral device connection of the NICE3000^{new}:

- Do not install the capacitor or surge suppressor on the output side of the controller. Otherwise, it may cause faults to the controller or damage to the capacitor and surge suppressor.
- Inputs/Outputs (main circuit) of the controller contain harmonics, which may interfere with the communication device connected to the controller. Therefore, install an anti-interference filter to minimize the interference.
- Select peripheral devices and options according to actual site conditions and section 3.2 "Peripheral Device Selection Guide".

3.2 Peripheral Device Selection Guide

3.2.1 Selection Guide of Cable, Circuit Breaker, and Contactor

1 Selection guide of I/O cable, circuit breaker, and electromagnetic contactor

Table 3-2 Peripheral device selection of the NICE3000^{new}

Controller Model	Recommended Fuse on the Input Side UL-Certified Bussmann FWH Series	Recommended Circuit Breaker (A)	Recommended Contactor (A)	Recommended Main Circuit Cable (mm^2)	Recommended Control Cable (mm^2)	Recommended Grounding Cable (mm^2)
Single-phase 220 V, range: 220–240 V, 50/60 Hz						
NICE-L-C-2002	FWH-35B	16	12	1	0.75	1
NICE-L-C-2003	FWH-35B	20	18	2.5	0.75	2.5
220-NICE-L-C-4007	FWH-35B	25	18	4	0.75	4
220-NICE-L-C-4011	FWH-40B	40	25	6	0.75	6
220-NICE-L-C-4015	FWH-50B	50	32	6	0.75	6
220-NICE-L-C-4018	FWH-60B	50	38	6	0.75	6
220-NICE-L-C-4018F						

Controller Model	Recommended Fuse on the Input Side UL-Certified Bussmann FWH Series	Recommended Circuit Breaker (A)	Recommended Contactor (A)	Recommended Main Circuit Cable (mm^2)	Recommended Control Cable (mm^2)	Recommended Grounding Cable (mm^2)
220-NICE-L-C-4022 220-NICE-L-C-4022F	FWH-70B	63	50	10	0.75	10
220-NICE-L-C-4030 220-NICE-L-C-4030F	FWH-80B	80	65	16	0.75	16
Three-phase 220 V, range: 220–240 V, 50/60 Hz						
NICE-L-C-2002	FWH-35B	16	12	1.5	0.75	1.5
NICE-L-C-2003	FWH-35B	25	18	2.5	0.75	2.5
220-NICE-L-C-4007	FWH-35B	32	25	4	0.75	4
220-NICE-L-C-4011	FWH-45B	40	32	6	0.75	6
220-NICE-L-C-4015	FWH-60B	50	38	6	0.75	6
220-NICE-L-C-4018 220-NICE-L-C-4018F	FWH-70B	63	40	10	0.75	10
220-NICE-L-C-4022 220-NICE-L-C-4022F	FWH-80B	80	50	10	0.75	10
220-NICE-L-C-4030 220-NICE-L-C-4030F	FWH-125B	100	65	16	0.75	16
Three-phase 380 V, range: 380–440 V, 50/60 Hz						
NICE-L-C-4002	FWH-35B	10	9	0.75	0.75	0.75
NICE-L-C-4003	FWH-35B	16	12	1.5	0.75	1.5
NICE-L-C-4005	FWH-35B	25	18	2.5	0.75	2.5
NICE-L-C-4007	FWH-35B	32	25	4	0.75	4
NICE-L-C-4011	FWH-45B	40	32	6	0.75	6

Controller Model	Recommended Fuse on the Input Side UL-Certified Bussmann FWH Series	Recommended Circuit Breaker (A)	Recommended Contactor (A)	Recommended Main Circuit Cable (mm^2)	Recommended Control Cable (mm^2)	Recommended Grounding Cable (mm^2)
NICE-L-C-4015	FWH-60B	50	38	6	0.75	6
NICE-L-C-4018 NICE-L-C-4018F	FWH-70B	63	40	10	0.75	10
NICE-L-C-4022 NICE-L-C-4022F	FWH-80B	80	50	10	0.75	10
NICE-L-C-4030 NICE-L-C-4030F	FWH-100B	100	65	16	0.75	16
NICE-L-C-4037 NICE-L-C-4037F	FWH-125B	100	80	25	1.0	16
NICE-L-C-4045 NICE-L-C-4045F	FWH-150B	160	95	35	1.0	16
NICE-L-C-4055 NICE-L-C-4055F	FWH-200B	160	115	50	1.0	25
NICE-L-C-4075 NICE-L-C-4075F	FWH-275A	225	170	70	1.0	35
NICE-L-C-4090	FWH-300A	250	205	95	1.0	50
NICE-L-C-4110	FWH-350A	315	245	120	1.0	60
NICE-L-C-4132	FWH-400A	350	300	120	1.0	60
NICE-L-C-4160	FWH-500A	400	300	150	1.0	75

2 Selection of ELCB

The earth leakage current of the controller is larger than 3.5 mA, requiring grounding protection.

The controller generates DC leakage current in protective conductor. In this case, a time-delay B-type ELCB must be used.

When the ELCB malfunction occurs, you can:

- Use an ELCB with higher rated action current or a time-delay ELCB.
- Reduce the carrier frequency.
- Shorten the length of the motor drive cables.
- Install a current leakage suppression device.
- Use Chint Electric and Schneider brands.

3.2.2 Selection Guide of AC Input Reactor

An AC input reactor is installed to eliminate the harmonic current on the input side. As an optional device, the reactor can be installed externally to meet strict requirements of an application environment for harmonics. The recommended AC input reactor manufacturer and models are listed in the following table.

1 Recommended AC input reactor models

Table 3-3 Recommended AC input reactor models

Controller Model	Rated Input Current (A)	AC Input Reactor Model (Inovance)
Three-phase 380 V, range: 380 — 440 V		
NICE-L-C-4002	6.5	MD-ACL-7-3.5-4T-4%
NICE-L-C-4003	10.5	MD-ACL-10-2.8-4T-4%
NICE-L-C-4005	14.8	MD-ACL-15-1.9-4T-4%
NICE-L-C-4007	20.5	MD-ACL-20-1.4-4T-4%
NICE-L-C-4011	29.0	MD-ACL-30-0.93-4T-4%
NICE-L-C-4015	36.0	MD-ACL-40-0.7-4T-4%
NICE-L-C-4018	41.0	MD-ACL-50-0.56-4T-4%
NICE-L-C-4018F		
NICE-L-C-4022	49.5	MD-ACL-50-0.56-4T-4%
NICE-L-C-4022F		
NICE-L-C-4030	62.0	MD-ACL-60-0.24-4T-2%
NICE-L-C-4030F		
NICE-L-C-4037	77.0	MD-ACL-90-0.16-4T-2%
NICE-L-C-4037F		
NICE-L-C-4045	93.0	MD-ACL-120-0.12-4T-2%
NICE-L-C-4045F		
NICE-L-C-4055	113.0	MD-ACL-150-0.095-4T-2%
NICE-L-C-4055F		

Controller Model	Rated Input Current (A)	AC Input Reactor Model (Inovance)
NICE-L-C-4075	157.5	MD-ACL-200-0.07-4T-2%
NICE-L-C-4075F		
NICE-L-C-4090	180.0	MD-ACL-250-0.056-4T-2%
NICE-L-C-4110	214.0	MD-ACL-250-0.056-4T-2%
NICE-L-C-4132	256.0	MD-ACL-330-0.042-4T-2%
NICE-L-C-4160	307.0	MD-ACL-330-0.042-4T-2%

2 Designation rule of AC input reactor

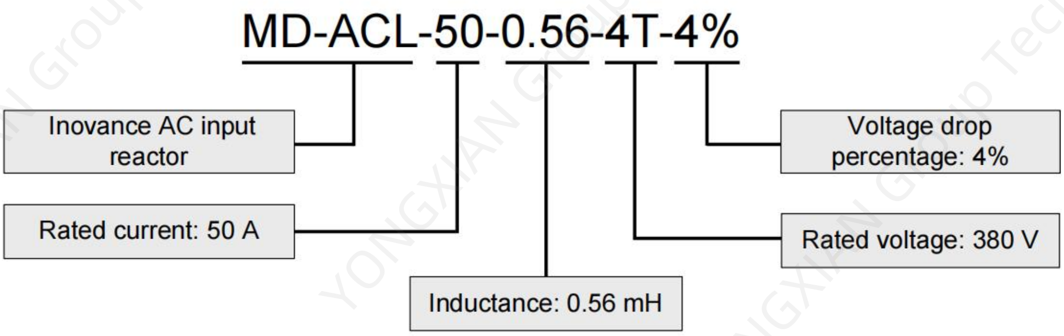


Figure 3-2 Designation rule of AC input reactor

3 Physical dimensions of AC input reactor

Physical dimensions of 7–10 A AC input reactor

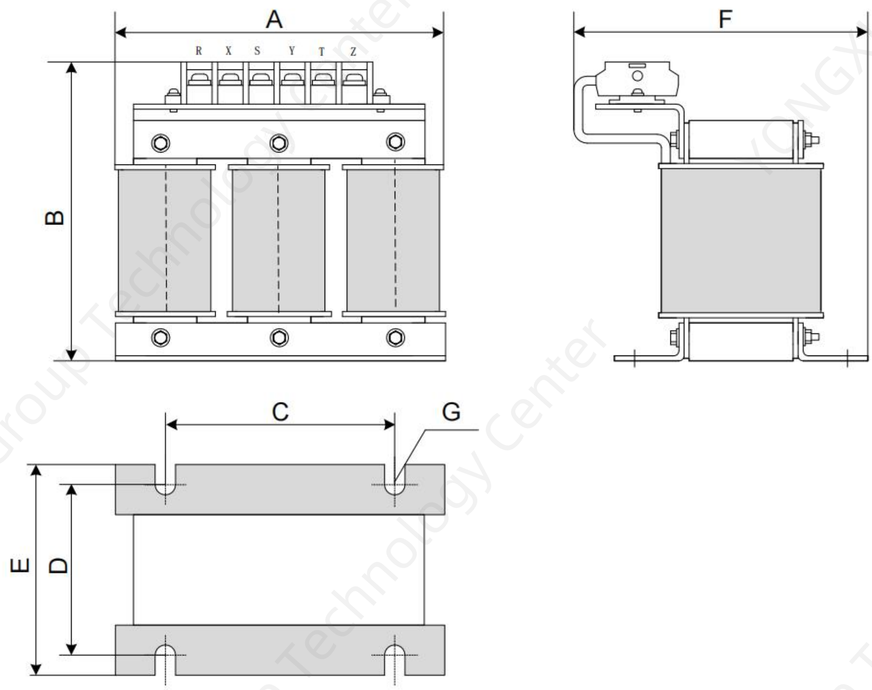


Figure 3-3 Physical dimension diagram of 7–10 A AC input reactor

Table 3-4 Physical dimensions of 7–10 A AC input reactor

Rated motor current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
7	155 max	175max	95 ± 0.5	61 ± 2.0	76 ± 2.0	110max	Φ6*15
10	155 max	175max	95 ± 0.5	80 ± 2.0	95 ± 2.0	130max	Φ6*15

Physical dimensions of 15–50 A AC input reactor

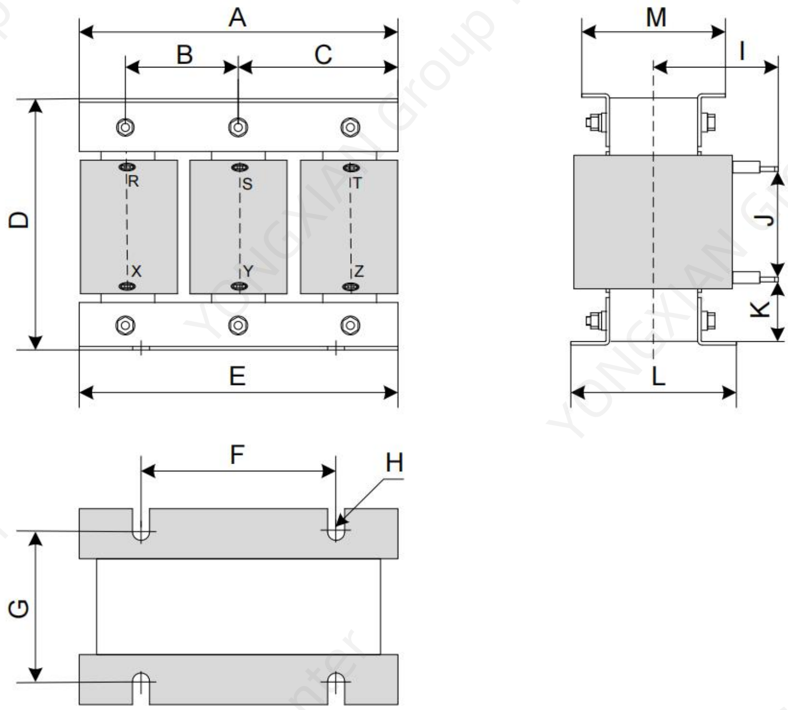


Figure 3-4 Physical dimension diagram of 15–50 A AC input reactor

Table 3-5 Physical dimensions of 15–50 A AC input reactor

Rated Current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)	M (mm)
15	195 max	64	94	165 max	188	120 ± 1	97 ± 2	Φ8.5*20	100 ± 10	75 ± 5	35 ± 5	125 max	100 max
20	195 max	64	94	165 max	188	120 ± 1	97 ± 2	Φ8.5*20	100 ± 10	75 ± 5	35 ± 5	125 max	100 max
30	195 max	64	94	165 max	188	120 ± 1	102 ± 2	Φ8.5*20	100 ± 10	75 ± 5	35 ± 5	130 max	105 max
40	195 max	64	94	165 max	188	120 ± 1	102 ± 2	Φ8.5*20	100 ± 10	75 ± 5	35 ± 5	130 max	105 max
50	195 max	64	94	185 max	188	120 ± 1	107 ± 2	Φ8.5*20	105 ± 10	85 ± 5	45 ± 5	135 max	-

Physical dimensions of 60 A AC input reactor

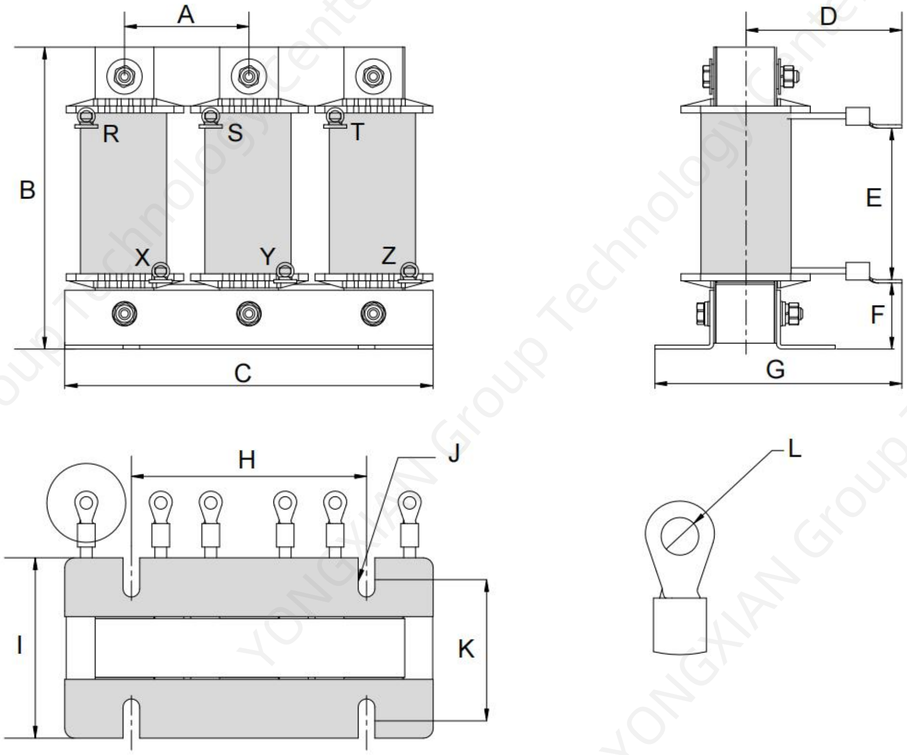


Figure 3-5 Physical dimension diagram of 60 A AC input reactor

Table 3-6 Physical dimensions of 60 A AC input reactor

Rated Current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
60	64	160	195	80 ± 10	75 ± 5	35 ± 5	135	120 ± 1	92 ± 2	Φ8.5*20	72 ± 2	Φ6.4

Physical dimensions of 90–120 A AC input reactor

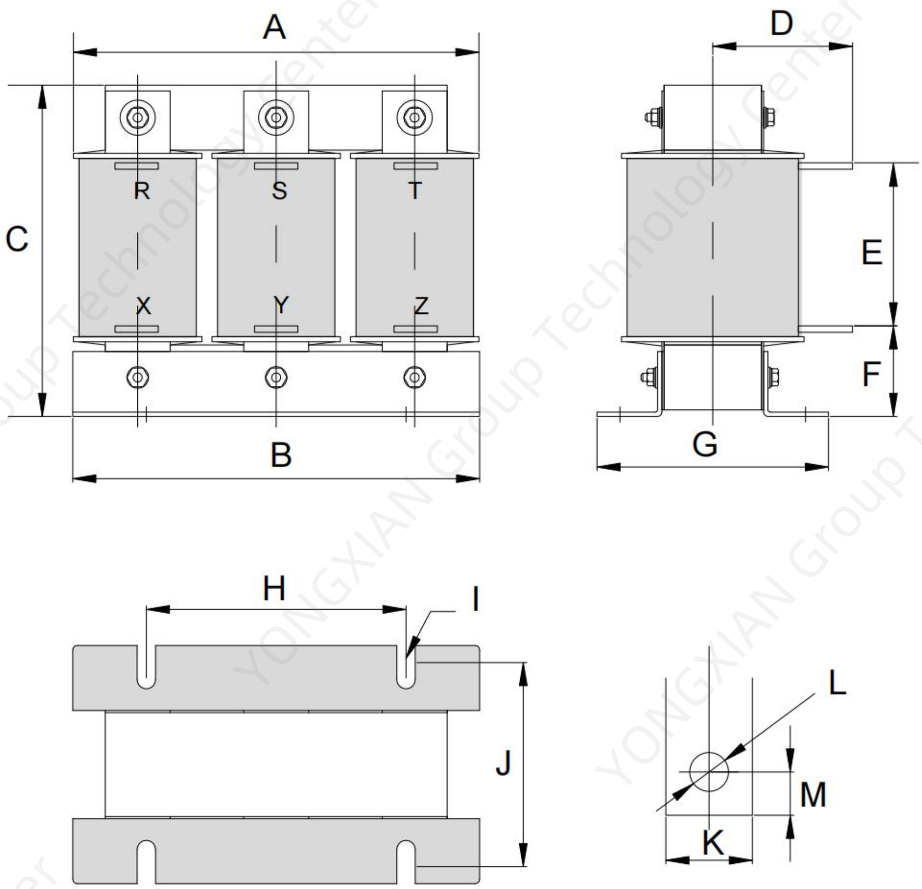


Figure 3-6 Physical dimension diagram of 90–120 A AC input reactor

Table 3-7 Physical dimensions of 90–120 A AC input reactor

Rated Current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)	M (mm)
90	195	188 ± 1	160	-	-	-	150	120 ± 1	Φ8.5*20	72 ± 2	-	-	-
120	195	188 ± 1	160	78 ± 10	79 ± 5	40 ± 5	135	120 ± 1	Φ8.5*20	92 ± 2	20	Φ9	10

Physical dimensions of 150-330A AC input reactor

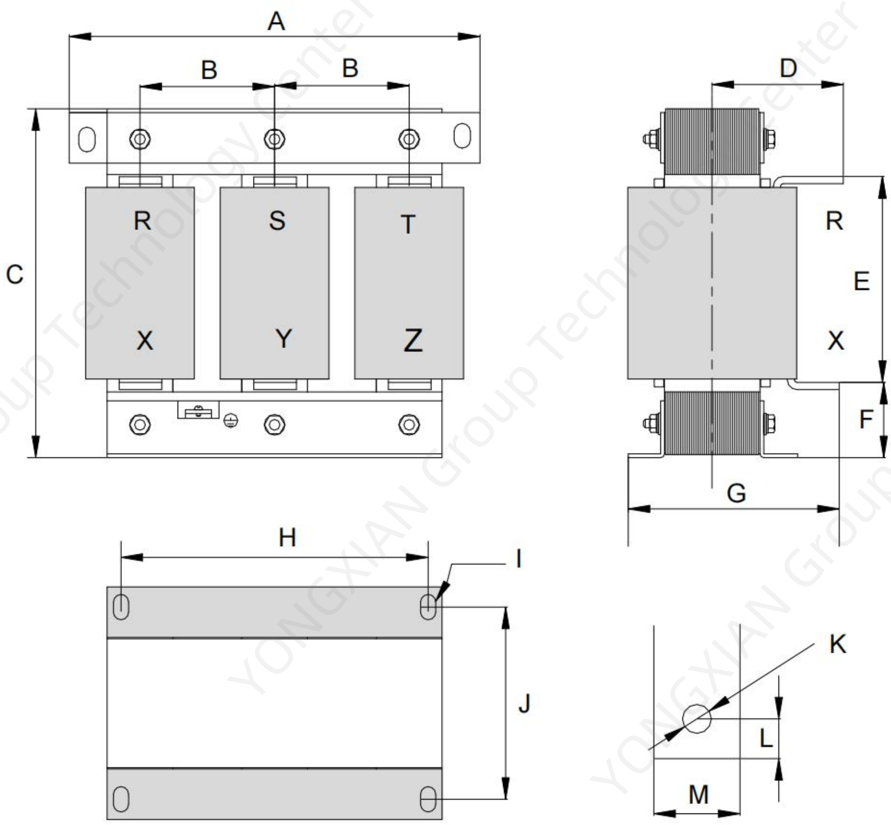


Figure 3-7 Physical dimension diagram of 150-330A AC input reactor

Table 3-8 Physical dimensions of 150-330A AC input reactor

Rated Current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)	M (mm)
150	250	81 ± 5	230	92 ± 10	145 ± 5	38 ± 5	155	182 ± 1	Φ11*18	76 ± 2	Φ11	13	25
200	250	81 ± 5	230	102 ± 10	145 ± 5	40 ± 5	175	182 ± 1	Φ11*18	96 ± 2	Φ11	13	25
250	250	81 ± 5	260	102 ± 10	160 ± 5	50 ± 5	175	182 ± 1	Φ11*18	96 ± 2	Φ11	13	25
330	290	95 ± 5	275	107 ± 10	160 ± 5	60 ± 5	180	214 ± 1	Φ11*18	100 ± 2	Φ12	15	30

NOTE

◆ The dimensions of the AC reactors provided here are for reference only, and the actual dimensions are subject to the material product.

3.2.3 Selection Guide of EMC Filter

Pay attentions to the following precautions before performing commissioning:
⚠ Caution ◆ Select a cable as short as possible to connect the filter and the controller. The cable length must be less than 30 cm. Make sure to connect the filter and the controller to the same grounding reference surface to implement reliable grounding of the filter. Otherwise, the desired filtering effect will not be achieved.

1 Standard EMC filter

This type of filters satisfy the EN 61800-3 category C2 and EN12015 requirement of CE certification. Connect the filter to ground reliably and ensure that the length of the cable connecting the controller and the filter is less than 30 cm. For detailed specification on cables, see Table 3-2 Peripheral device selection of the NICE3000new.

■ Appearance

Schaffner FN3258 series filter

Schaffner FN3359 series filter

Jianli series filter

Figure 3-8 Appearance of standard EMC filters

■ Recommended selection

Schaffner and Jianli filters are recommended, as listed in the following table.

Table 3-9 Recommended standard EMC input filter manufacturers and models

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	AC Input Filter Model (Changzhou Jianli)	AC Input Filter Model (Schaffner)
Three-phase 380 V, range: 380 — 440 V				
NICE-L-C-4002	4.0	6.5	DL-10EBK5	FN 3258-7-44
NICE-L-C-4003	5.9	10.5	DL-16EBK5	FN 3258-16-44
NICE-L-C-4005	8.9	14.8	DL-16EBK5	FN 3258-16-44
NICE-L-C-4007	11.0	20.5	DL-25EBK5	FN 3258-30-33
NICE-L-C-4011	17.0	29.0	DL-35EBK5	FN 3258-30-33
NICE-L-C-4015	21.0	36.0	DL-50EBK5	FN 3258-42-33
NICE-L-C-4018 NICE-L-C-4018F	24.0	41.0	DL-50EBK5	FN 3258-42-33
NICE-L-C-4022 NICE-L-C-4022F	30.0	49.5	DL-50EBK5	FN 3258-55-34
NICE-L-C-4030 NICE-L-C-4030F	40.0	62.0	DL-65EBK5	FN 3258-75-34
NICE-L-C-4037 NICE-L-C-4037F	57.0	77.0	DL-80EBK5	FN 3258-100-35
NICE-L-C-4045 NICE-L-C-4045F	69.0	93.0	DL-100EBK5	FN 3258-100-35
NICE-L-C-4055 NICE-L-C-4055F	85.0	113.0	DL-130EBK5	FN 3258-130-35
NICE-L-C-4075 NICE-L-C-4075F	114.0	157.5	DL-160EBK5	FN 3258-180-40
NICE-L-C-4090	134.0	180.0	DL-200EBK5	FN 3258-180-40
NICE-L-C-4110	160.0	214.0	DL-250EBK5	FN 3270H-250-99
NICE-L-C-4132	192.0	256.0	DL-300EBK3	FN 3270H-320-99
NICE-L-C-4160	231.0	307.0	DL-400EBK3	FN 3270H-320-99
Three-phase 220 V, range: 220–240 V				
NICE-L-C-2002	4.0	11.0	DL-16EBK5	FN 3258-16-44
NICE-L-C-2003	5.9	17.0	DL-25EBK5	FN 3258-30-33
220-NICE-L-C-4007	7.0	20.5	DL-25EBK5	FN 3258-30-33
220-NICE-L-C-4011	10.0	29.0	DL-35EBK5	FN 3258-30-33
220-NICE-L-C-4015	12.6	36.0	DL-50EBK5	FN 3258-42-33
220-NICE-L-C-4018 220-NICE-L-C-4018F	15	41.0	DL-50EBK5	FN 3258-42-33

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	AC Input Filter Model (Changzhou Jianli)	AC Input Filter Model (Schaffner)
220-NICE-L-C-4022	18.3	49.0	DL-50EBK5	FN 3258-55-34
220-NICE-L-C-4022F				
220-NICE-L-C-4030	23	62.0	DL-65EBK5	FN 3258-75-34
220-NICE-L-C-4030F				
Single-phase 220 V, range: 220 — 240 V				
NICE-L-C-2002	2.0	9.2	DL-20TH1	FN2090-20-06
NICE-L-C-2003	2.9	13.3	DL-20TH1	FN2090-20-06
220-NICE-L-C-4007	3.9	17.9	DL-20TH1	FN2090-30-08
220-NICE-L-C-4011	5.9	25.3	DL-30TH1	FN2090-30-08
220-NICE-L-C-4015	7.3	31.3	DL-40TH1	FN 2010-60-24
220-NICE-L-C-4018	8.6	34.6	DL-40TH1	FN 2010-60-24
220-NICE-L-C-4018F				
220-NICE-L-C-4022	10.6	42.6	DL-100TH1	FN 2010-60-24
220-NICE-L-C-4022F				
220-NICE-L-C-4030	13.1	52.6	DL-100TH1	FN 2010-60-24
220-NICE-L-C-4030F				

2 Simple EMC input filter

A simple EMC input filter is installed to suppress surrounding interference affecting the controller and interference generated by the controller during running.

Connect the simple EMC input filter to ground reliably and ensure that the length of the cable connecting the controller and the filter is less than 30 cm.

Table 3-10 Recommended simple EMC input filter manufacturers and models

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	Simple EMC Input Filter Model (Changzhou Jianli)
Three-phase 380 V, range: 380 — 440 V			
NICE-L-C-4002	4.0	6.5	DL-15EB1/10
NICE-L-C-4003	5.9	10.5	DL-15EB1/10
NICE-L-C-4005	8.9	14.8	DL-15EB1/10
NICE-L-C-4007	11.0	20.5	DL-35EB1/10
NICE-L-C-4011	17.0	29.0	DL-35EB1/10
NICE-L-C-4015	21.0	36.0	DL-65EB1/10
NICE-L-C-4018	24.0	41.0	DL-65EB1/10
NICE-L-C-4018F			
NICE-L-C-4022	30.0	49.5	DL-65EB1/10
NICE-L-C-4022F			
NICE-L-C-4030	40.0	62.0	DL-65EB1/10
NICE-L-C-4030F			

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	Simple EMC Input Filter Model (Changzhou Jianli)
NICE-L-C-4037 NICE-L-C-4037F	57.0	77.0	DL-120EBK5
NICE-L-C-4045 NICE-L-C-4045F	69.0	93.0	DL-120EBK5
NICE-L-C-4055 NICE-L-C-4055F	85.0	113.0	DL-120EB1/10
NICE-L-C-4075 NICE-L-C-4075F	114.0	157.5	DL-180EB1/10
NICE-L-C-4090	134.0	180.0	DL-180EB1/10
NICE-L-C-4110	160.0	214.0	None
NICE-L-C-4132	192.0	256.0	None
NICE-L-C-4160	231.0	307.0	None
Three-phase 220 V, range: 220–240 V			
NICE-L-C-2002	4.0	11.0	DL-15EB1/10
NICE-L-C-2003	5.9	17.0	DL-35EB1/10
220-NICE-L-C-4007	7.0	20.5	DL-35EB1/10
220-NICE-L-C-4011	10.0	29.0	DL-35EB1/10
220-NICE-L-C-4015	12.6	36.0	DL-65EB1/10
220-NICE-L-C-4018 220-NICE-L-C-4018F	15.0	41.0	DL-65EB1/10
220-NICE-L-C-4022 220-NICE-L-C-4022F	18.3	49.0	DL-65EB1/10
220-NICE-L-C-4030 220-NICE-L-C-4030F	23.0	62.0	DL-65EB1/10

3.2.4 Selection Guide of Braking Components

1 Regen esistor

■ Selection of resistance of of regen. resistor

During braking, almost all regenerative energy of the motor is consumed by the regen. resistor. The resistance of the regen. resistor is calculated by the following formula:

$$U \times U/R = Pb$$

U – Braking voltage at system stable braking. U varies depending on different systems. The MD500 AC drive usually selects the 760 V braking voltage, which can be adjusted by setting F9-08;

Pb – Braking power

■ Selection of power of regen. resistor

In theory, power of regen. resistor is the same as the braking power. However, consideration must be given to the deration K. The following formula shall be used:

$$K \times Pr = Pb \times D$$

K – Set to approximately 50%;

Pr – Power of the regen. resistor

D – Braking frequency (percentage of regenerative process to whole deceleration).

The following two formulas can be obtained:

$$K \times Pr = Pb \times D = U \times U/R \times D$$

$$Pr = (U \times U \times D)/(R \times K)$$

The regen. resistor power is calculated accordingly.

K is the derating coefficient of regen. resistor. Low K value ensures that the regen. resistor does not get overheated. The K value can be increased appropriately on the condition of good dissipation and should not exceed 50%. Failure to comply may result in a fire due to overheating of regen. resistor.

Braking frequency (D) is determined by application. Typical values of braking frequency in different applications are listed in the following table.

Table 3-11 Typical values of braking frequency in different applications

Application	Elevator	Winding and unwinding	Centrifuge	Occasional braking load	General application
Braking Frequency	20% to 30%	20% to 30%	50% to 60%	5%	10%

■ Selection guide of regen. resistor

Table 3-12 Selection of braking components of the NICE3000^{new}

Controller Model	Power of Applicable Motor (kW)	Max. Resistance of Regen. Resistor (Ω)	Min. Resistance of Regen. Resistor (Ω)	Power (W)	Braking Unit
Single-phase 220 V, range: 220 – 240 V					
NICE-L-C-2002	1.1	145.0	125.0	300	Built-in
NICE-L-C-2003	1.5	105.0	90.0	450	
220-NICE-L-C-4007	2.2	72.0	63.0	600	
220-NICE-L-C-4011	3.7	43.0	37.0	1100	
220-NICE-L-C-4015	4.0	40.0	35.0	1200	
220-NICE-L-C-4018	5.5	29.0	25.0	1600	
220-NICE-L-C-4018F					
220-NICE-L-C-4022	11.0	18.0	16.0	3500	Built-in
220-NICE-L-C-4022F					
220-NICE-L-C-4030	15.0	13.0	13.0	4500	
220-NICE-L-C-4030F					

Controller Model	Power of Applicable Motor (kW)	Max. Resistance of Regen. Resistor (Ω)	Min. Resistance of Regen. Resistor (Ω)	Power (W)	Braking Unit
Three-phase 220 V, range: 220–240 V					
NICE-L-C-2002	2.2	72.0	65.0	600	Built-in
NICE-L-C-2003	3.7	54.0	50.0	1100	
220-NICE-L-C-4007	4.0	40.0	35.0	1200	
220-NICE-L-C-4011	5.5	29.0	25.0	1600	
220-NICE-L-C-4015	7.5	26.0	22.0	2500	
220-NICE-L-C-4018	11.0	14.5	13.0	3500	
220-NICE-L-C-4018F					
220-NICE-L-C-4022	15.0	13.0	12.5	4500	
220-NICE-L-C-4022F					
220-NICE-L-C-4030	18.5	12.5	12.0	5500	
220-NICE-L-C-4030F					
220-NICE-L-C-4037	22.0	7.5	6.0	6500	MDBUN-60-2T
220-NICE-L-C-4037F					Built-in
220-NICE-L-C-4045	30.0	5.5	4.5	9000	MDBUN-90-2T
220-NICE-L-C-4055	37.0	4.5	3.5	11000	MDBUN-60-2T×2
Three-phase 380 V, range: 380 — 440 V					
NICE-L-C-4002	2.2	290	230	600	Built-in
NICE-L-C-4003	3.7	170	135	1100	
NICE-L-C-4005	5.5	115	90	1600	
NICE-L-C-4007	7.5	85	65	2500	
NICE-L-C-4011	11	55	43	3500	
NICE-L-C-4015	15	43	35	4500	
NICE-L-C-4018	18.5	34.0	25	5500	
NICE-L-C-4018F					
NICE-L-C-4022	22	24	22	6500	Built-in
NICE-L-C-4022F					
NICE-L-C-4030	30	20	16	9000	
NICE-L-C-4030F					
NICE-L-C-4037	37	16.0	13	11000	MDBUN-60-T
NICE-L-C-4037F					
NICE-L-C-4045	45	14.0	11	13500	MDBUN-60-T
NICE-L-C-4045F					
NICE-L-C-4055	55	12.0	10	16500	MDBUN-90-T
NICE-L-C-4055F					

Controller Model	Power of Applicable Motor (kW)	Max. Resistance of Regen. Resistor (Ω)	Min. Resistance of Regen. Resistor (Ω)	Power (W)	Braking Unit
NICE-L-C-4075	75	16×2	13×2	12000×2	MDBUN-60-T×2
NICE-L-C-4075F					
NICE-L-C-4090	90	14×2	13×2	13500×2	MDBUN-60-T×2
NICE-L-C-4110	110	12×2	9×2	18000×2	MDBUN-90-T×2
NICE-L-C-4132	132	13.5×3	10.5×3	14000×3	MDBUN-90-T×3
NICE-L-C-4160	160	12×3	9×3	18000×3	MDBUN-90-T×3

NOTE

- This algorithm takes the synchronous motor as an example. The asynchronous motor has a low transfer efficiency, so you can properly reduce the power of the regen. resistor or increase the resistance of the regen. resistor.
- It is recommended to select a resistance as close to the min. resistance as possible during the selection of a resistor.
- ×2 indicates two sets of corresponding accessories are required. For example, "9×2, 18000×2, MDBUN-90-T×2" in NICE-L-C-4110 indicates that two groups of "(9 Ω, 18000 W) regen. resistor + MDBUN-90-T" configurations must be connected in parallel to the controller.
- ×3 indicates that 3 groups must be connected in parallel.

2 Braking Unit

■ Physical dimension diagram of MDBUN series braking unit

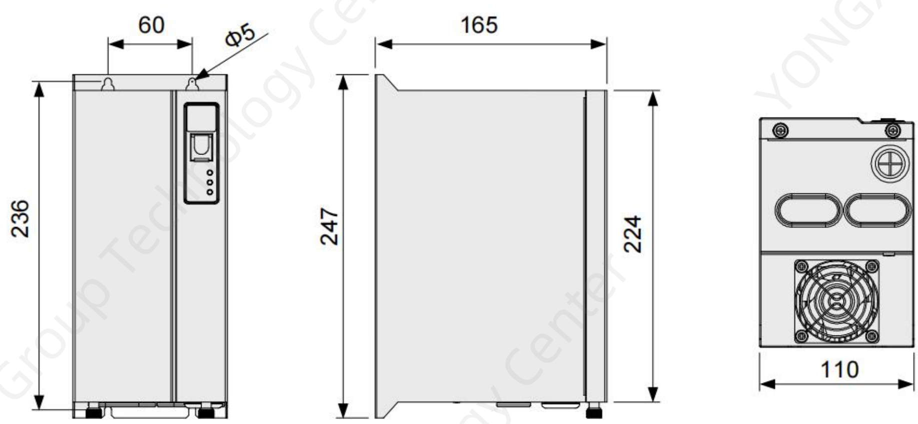


Figure 3-9 Appearance and mounting dimension diagram of braking unit (unit: mm)

■ Mounting dimension diagram of MDBUN series braking unit

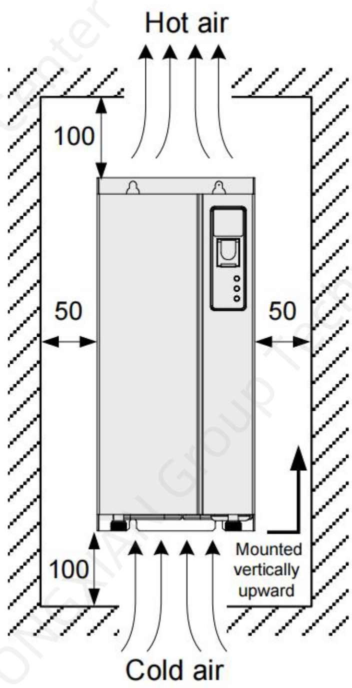


Figure 3-10 Mounting distance diagram of braking unit (unit: mm)

NOTE

◆ For the details of MDBUN mounting and operation, refer to the (19010143) MDBUN Braking Unit User Manual.

3.2.5 Selection Guide of AC Output Reactor

You can configure an AC output reactor on the controller output side as the case may be. The transmission cable between the controller and the motor shall not be too long, otherwise its large distributed capacitance may result in higher harmonic current.

When the output cable is too long, an output reactor shall be configured. When the cable length is greater than or equal to a value shown in the following table, install an AC output reactor close to the drive.

Table 3-13 Minimum cable length for installing AC output reactor

Controller Power (kW)	Rated Voltage (V)	Min. Cable Length for Optional Output Reactor (m)
4	200 to 500	50
5.5	200 to 500	70
7.5	200 to 500	100
11	200 to 500	110
15	200 to 500	125
18.5	200 to 500	135
22	200 to 500	150
⩾ 30	280 to 690	150

■ Recommended AC output reactor models

Table 3-14 Recommended AC output reactor manufacturers and models

Controller Model	Rated Output Current (A)	AC Output Reactor Model (Inovance)
Three-phase 380 V, range: 380 — 440 V		
NICE-L-C-4002	5.1	MD-OCL-7-1.0-4T-1%
NICE-L-C-4003	9.0	MD-OCL-10-0.7-4T-1%
NICE-L-C-4005	13.0	MD-OCL-15-0.47-4T-1%
NICE-L-C-4007	18.0	MD-OCL-20-0.35-4T-1%
NICE-L-C-4011	27.0	MD-OCL-30-0.23-4T-1%
NICE-L-C-4015	33.0	MD-OCL-40-0.18-4T-1%
NICE-L-C-4018	39.0	MD-OCL-50-0.14-4T-1%
NICE-L-C-4018F		
NICE-L-C-4022	48.0	MD-OCL-50-0.14-4T-1%
NICE-L-C-4022F		
NICE-L-C-4030	60.0	MD-OCL-60-0.12-4T-1%
NICE-L-C-4030F		
NICE-L-C-4037	75.0	MD-OCL-80-0.087-4T-1%
NICE-L-C-4037F		
NICE-L-C-4045	91.0	MD-OCL-120-0.058-4T-1%
NICE-L-C-4045F		
NICE-L-C-4055	112.0	MD-OCL-120-0.058-4T-1%
NICE-L-C-4055F		
NICE-L-C-4075	150.0	MD-OCL-150-0.047-4T-1%
NICE-L-C-4075F		
NICE-L-C-4090	176.0	MD-OCL-200-0.035-4T-1%
NICE-L-C-4110	210.0	MD-OCL-250-0.028-4T-1%
NICE-L-C-4132	253.0	MD-OCL-330-0.021-4T-1%
NICE-L-C-4160	304.0	MD-OCL-330-0.021-4T-1%
Three-phase 220 V, range: 220–240 V		
NICE-L-C-2002	9.6	MD-OCL-10-0.7-4T-1%
NICE-L-C-2003	14.0	MD-OCL-15-0.47-4T-1%
220-NICE-L-C-4007	18.0	MD-OCL-20-0.35-4T-1%
220-NICE-L-C-4011	27.0	MD-OCL-30-0.23-4T-1%
220-NICE-L-C-4015	33.0	MD-OCL-40-0.18-4T-1%
220-NICE-L-C-4018	39.0	MD-OCL-40-0.18-4T-1%
220-NICE-L-C-4018F		
220-NICE-L-C-4022	48.0	MD-OCL-50-0.14-4T-1%
220-NICE-L-C-4022F		
220-NICE-L-C-4030	60.0	MD-OCL-60-0.12-4T-1%
220-NICE-L-C-4030F		
Single-phase 220 V, range: 220 — 240 V		
NICE-L-C-2002	5.2	MD-OCL-7-1.0-4T-1%
NICE-L-C-2003	7.5	MD-OCL-10-0.7-4T-1%
220-NICE-L-C-4007	10.3	MD-OCL-15-0.47-4T-1%

Controller Model	Rated Output Current (A)	AC Output Reactor Model (Inovance)
220-NICE-L-C-4011	15.5	MD-OCL-20-0.35-4T-1%
220-NICE-L-C-4015	19	MD-OCL-20-0.35-4T-1%
220-NICE-L-C-4018	22.5	MD-OCL-30-0.23-4T-1%
220-NICE-L-C-4018F		
220-NICE-L-C-4022	27.7	MD-OCL-30-0.23-4T-1%
220-NICE-L-C-4022F		
220-NICE-L-C-4030	34.6	MD-OCL-40-0.18-4T-1%
220-NICE-L-C-4030F		

■ Designation rule of AC output reactor

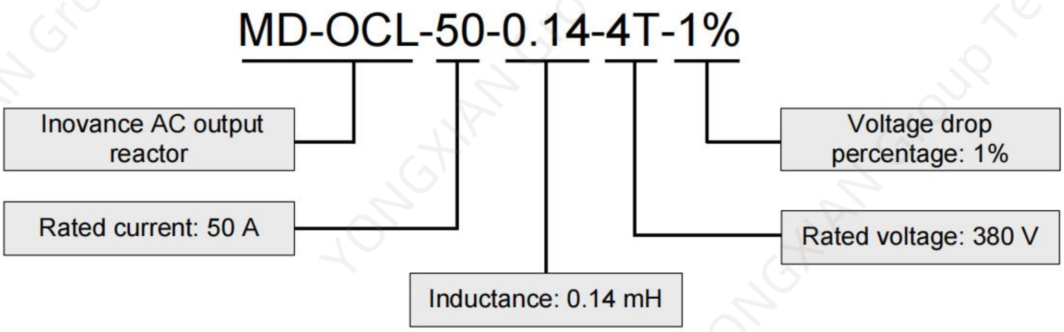


Figure 3-11 Designation rule of AC output reactor

■ Physical dimensions of AC output reactor

Physical dimensions of 5–20 A AC output reactor

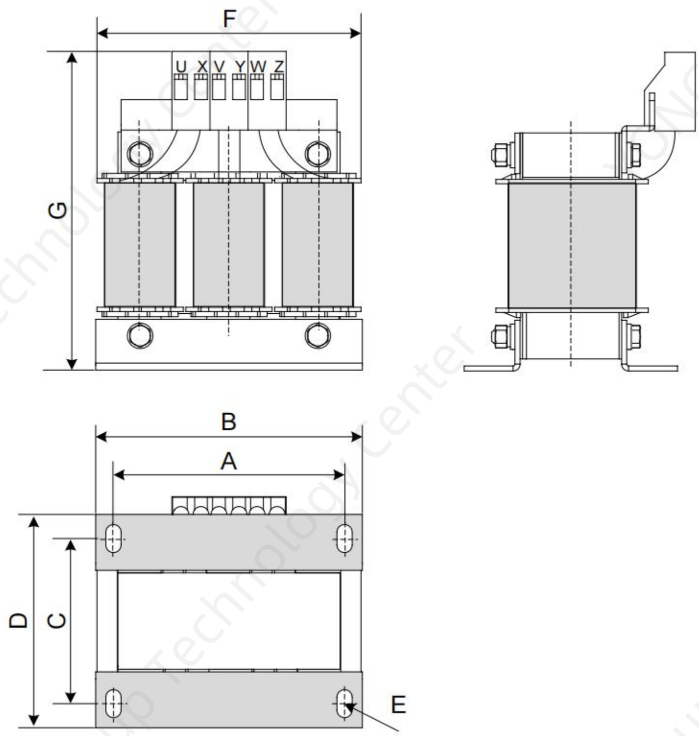


Figure 3-12 Physical dimension diagram of 5–10 A AC output react

Table 3-15 Physical dimensions of 5–10 A AC output reactor

Rated Current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
5							
7	91 ± 1	105 ± 1	65 ± 2	84 ± 2	4*Φ6*11	110max	130max
10							

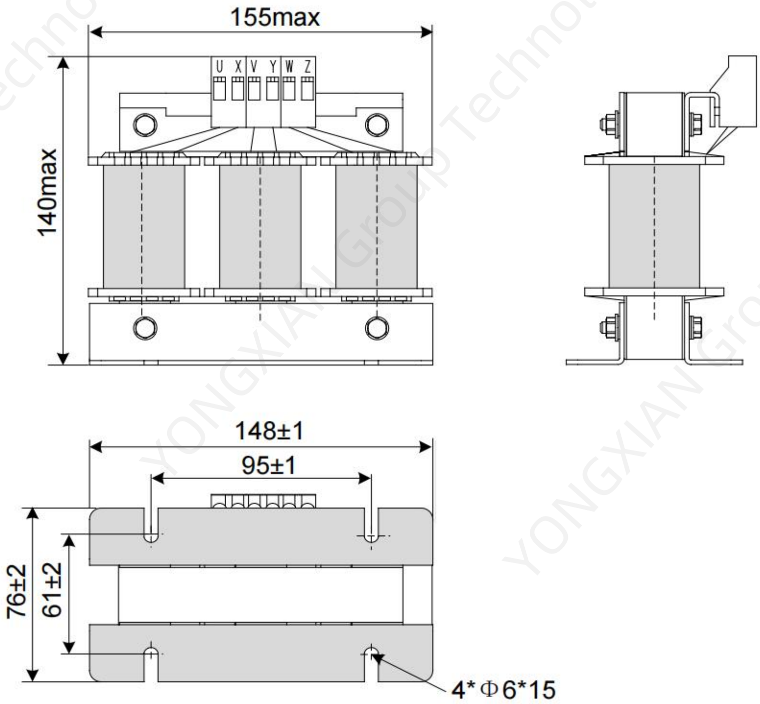


Figure 3-13 Physical dimension diagram of 15 A AC output reactor

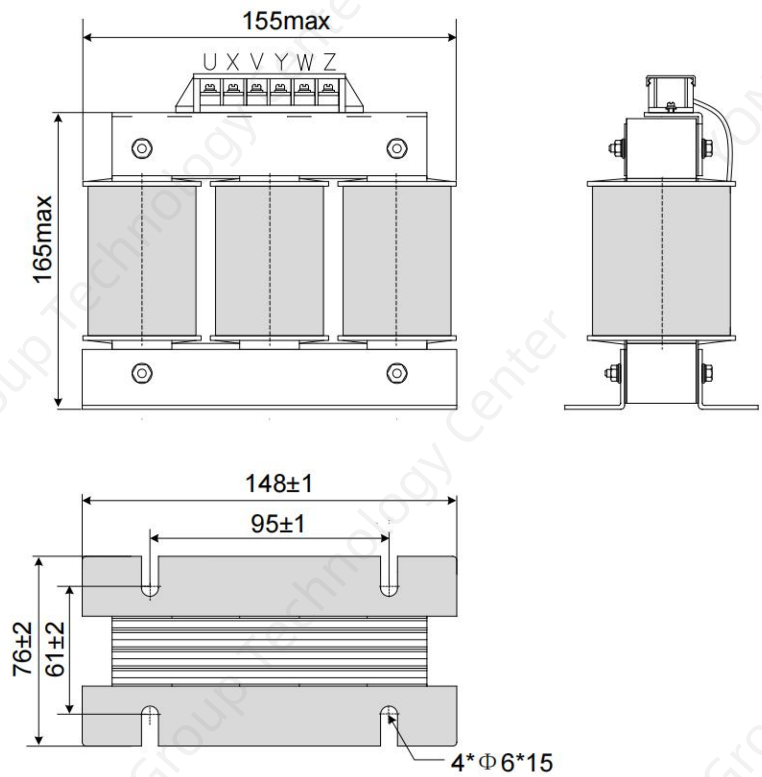


Figure 3-14 Physical dimension diagram of 20A AC output reactor

Physical dimensions of 50–120 A AC output reactor

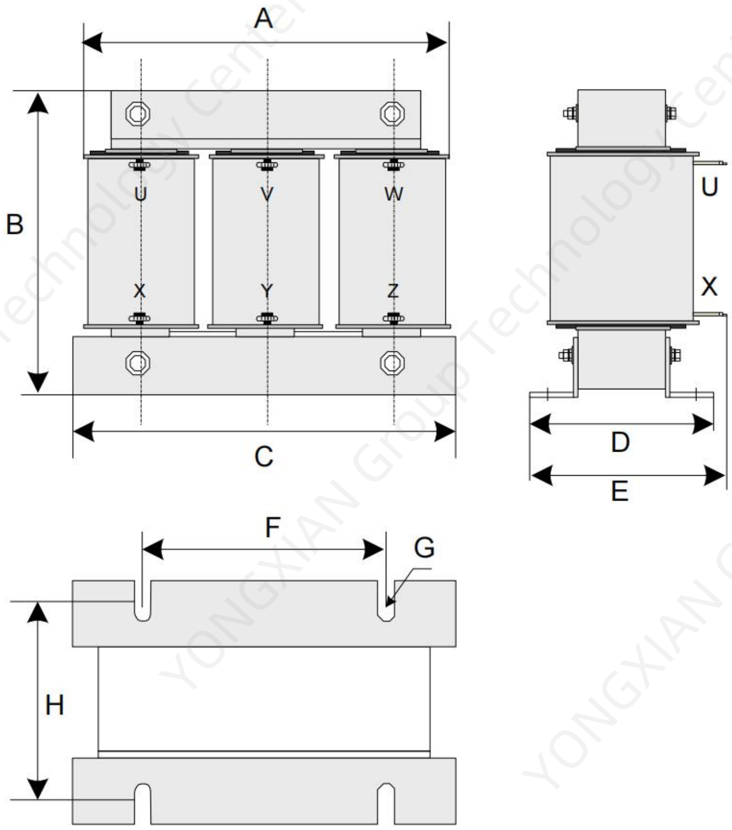


Figure 3-15 Physical dimension diagram of 50–120 A AC output reactor

Table 3-16 Physical dimensions of 50–120 A AC output reactor

Rated Current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
50	155	130	148	95	135	95	6*15	80
60	195	165	188	92	130	120	8.5*20	72
80	195	165	188	92	130	120	8.5*20	72
90	195	165	188	92	130	120	8.5*20	72
120	195	165	188	112	140	120	8.5*20	92

Physical dimensions of 150–250 A AC output reactor

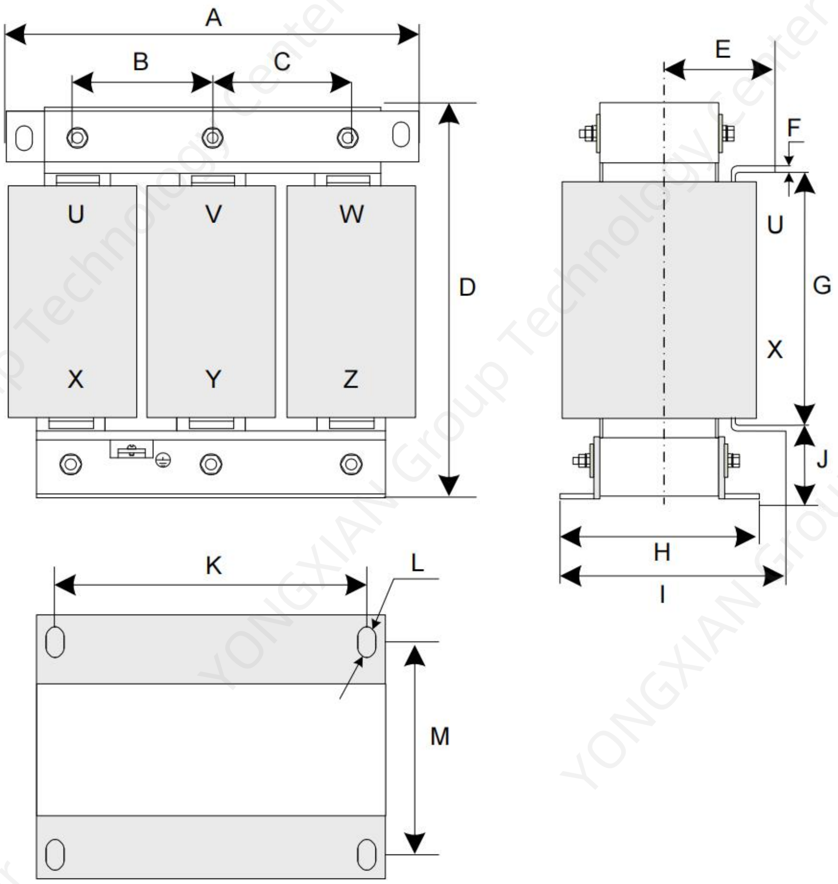


Figure 3-16 Physical dimension diagram of 150-250A AC output reactor

Table 3-17 Physical dimensions of 150-250A AC output reactor

Rated motor current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)	M (mm)
150	250	81	81	230	97	5	140	113	170	42	182	11*18	87
200	250	81	81	230	102	5	140	123	175	42	182	11*18	97
250	250	81	81	230	102	5	140	123	175	42	182	11*18	97

Physical dimensions of 330 A AC output reactor

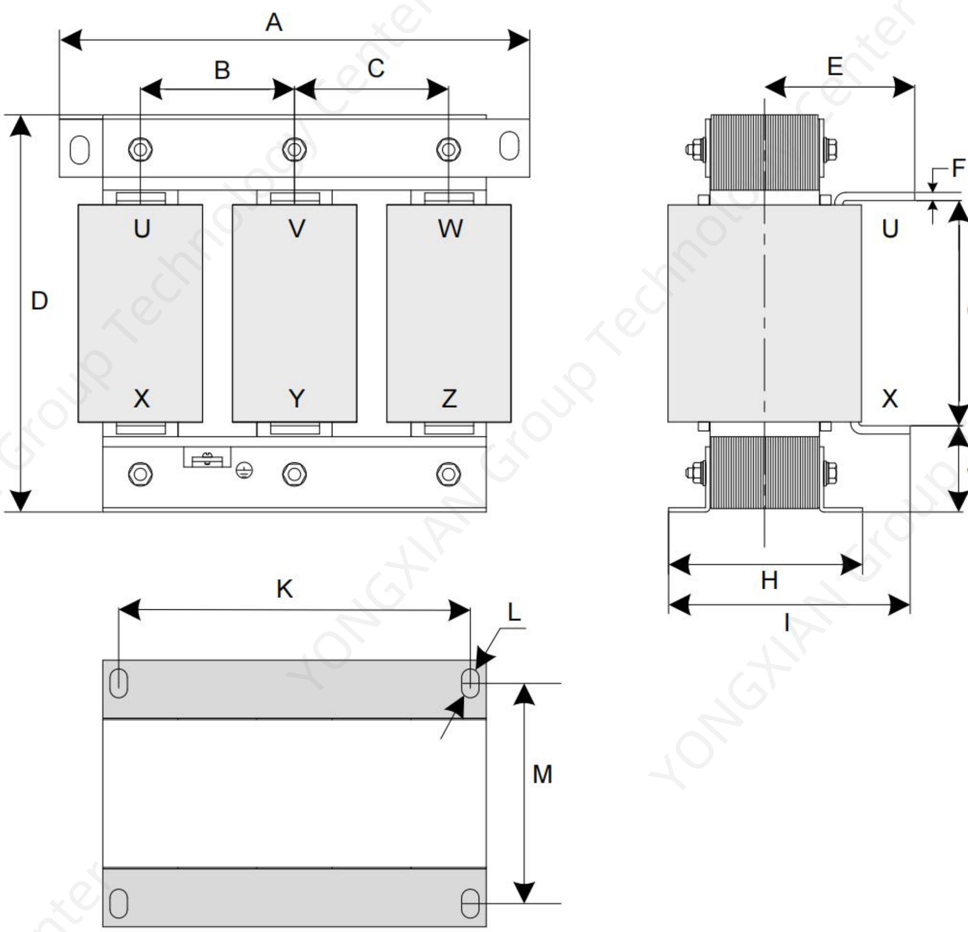


Figure 3-17 Physical dimension diagram of 330 A AC output reactor

Table 3-18 Physical dimensions of 330 A AC output reactor

Rated motor current (A)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)	M (mm)
330	290	95	95	250	110	5	155	132	190	45	214	11*18	106

NOTE

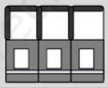
◆ The dimensions of the AC reactors provided here are for reference only, and the actual dimensions are subject to the material product.

3.2.6 Selection Guide of dv/dt Reactor

A dv/dt reactor is installed on the output side to reduce large dv/dt, protecting the motor windings from insulation breakdown, reduce motor temperature and extend the motor service life, and meanwhile reduce interference on surrounding devices.

dv/dt reactor selection (Schaffner)

Table 3-19 dv/dt reactor selection

Reactor	Rated Current at 40°C (A)	Rated Power of Typical Motor (kW)	Rated Inductance (mH)	Power Consumption (W)	I/O Terminal Selection			Total (kg)
								
RWK 305-4-KL	4	1.5	1.47	22	KL	-	-	1.2
RWK 305-7.8-KL	7.8	3	0.754	25	KL	-	-	1.2
RWK 305-10-KL	10	4	0.588	30	KL	-	-	1.8
RWK 305-14-KL	14	5.5	0.42	34	KL	-	-	2.2
RWK 305-17-KL	17	7.5	0.346	38	KL	-	-	2.5
RWK 305-24-KL	24	11	0.245	45	KL	-	-	2.5
RWK 305-32-KL	32	15	0.184	55	KL	-	-	3.9
RWK 305-45-KL	45	22	0.131	60	KL	-	-	6.1
RWK 305-60-KL	60	30	0.098	65	KL	-	-	6.1
RWK 305-72-KL	72	37	0.082	70	KL	-	-	6.1
RWK 305-90-KL	90	45	0.065	75	KL	-	-	7.4
RWK 305-110-KL	110	55	0.053	90	KL	-	-	8.2
RWK 305-124-KS	124	55	0.047	110	-	KS	-	8.2
RWK 305-143-KS	143	75	0.041	115	-	KS	-	10.7
RWK 305-156-KS	156	75	0.038	120	-	KS	-	10.7
RWK 305-170-KS	170	90	0.035	130	-	KS	-	10.7
RWK 305-182-KS	182	90	0.032	140	-	KS	-	16
RWK 305-230-KS	230	132	0.026	180	-	KS	-	22
RWK 305-280-KS	280	160	0.021	220	-	KS	-	29
RWK 305-330-KS	330	160	0.018	240	-	KS	-	32
RWK 305-400-S	400	200	0.015	330	-	-	S	34
RWK 305-500-S	500	250	0.012	340	-	-	S	35
RWK 305-600-S	600	355	0.01	380	-	-	S	37
RWK 305-680-S	680	400	0.009	410	-	-	S	38
RWK 305-790-S	790	450	0.007	590	-	-	S	43
RWK 305-910-S	910	500	0.006	740	-	-	S	49
RWK 305-1100-S	1100	630	0.005	760	-	-	S	66

3.2.7 Selection Guide of Common-Mode Filter

The common-mode filter is installed on the output side (close to the controller) to reduce the bearing current and reduce interference on the surrounding devices. The following figure shows installation of the common-mode filter.

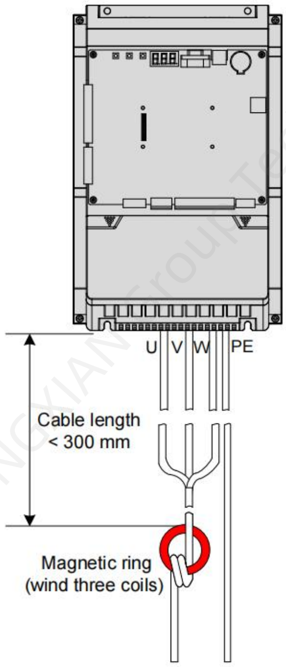


Figure 3-18 Installation of the common-mode filter

Table 3-20 Recommended common-mode filter model

Manufacturer model	Serial No.	Dimensions (Outer Diameter x Inner Diameter x Thickness) (mm)
DY644020H	11013031	64 × 40 × 20
DY805020H	11013032	80 × 50 × 20
DY1207030H	11013033	120 × 70 × 30

3.2.8 Selection Guide of Applicable Motor

Table 3-21 Selection of applicable motor

System Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Applicable Motor (kW)
Single-phase 220 V, range: 220 — 240 V				
NICE-L-C-2002	2.0	9.2	5.2	1.1
NICE-L-C-2003	2.9	13.3	7.5	1.5
220-NICE-L-C-4007	3.9	17.9	10.3	2.2
220-NICE-L-C-4011	5.9	25.3	15.5	3.7
220-NICE-L-C-4015	7.3	31.3	19	4.0
220-NICE-L-C-4018	8.6	34.6	22.5	5.5
220-NICE-L-C-4018F				
220-NICE-L-C-4022	10.6	42.6	27.7	11
220-NICE-L-C-4022F				
220-NICE-L-C-4030	13.1	52.6	34.6	15
220-NICE-L-C-4030F				
Three-phase 220 V, range: 220–240 V				
NICE-L-C-2002	4.0	11.0	9.6	2.2
NICE-L-C-2003	5.9	17.0	14.0	3.7
220-NICE-L-C-4007	7.0	20.5	18.0	4.0
220-NICE-L-C-4011	10.0	29.0	27.0	5.5
220-NICE-L-C-4015	12.6	36.0	33.0	7.5
220-NICE-L-C-4018	15.0	41.0	39.0	11.0
220-NICE-L-C-4018F				
220-NICE-L-C-4022	18.3	49.0	48.0	15.0
220-NICE-L-C-4022F				
220-NICE-L-C-4030	23.0	62.0	60.0	18.5
220-NICE-L-C-4030F				
Three-phase 380 V, range: 380 — 440 V				
NICE-L-C-4002	4.0	6.5	5.1	2.2
NICE-L-C-4003	5.9	10.5	9.0	3.7
NICE-L-C-4005	8.9	14.8	13.0	5.5
NICE-L-C-4007	11.0	20.5	18.0	7.5
NICE-L-C-4011	17.0	29.0	27.0	11.0
NICE-L-C-4015	21.0	36.0	33.0	15.0
NICE-L-C-4018	24.0	41.0	39.0	18.5
NICE-L-C-4018F				
NICE-L-C-4022	30.0	49.5	48.0	22.0
NICE-L-C-4022F				
NICE-L-C-4030	40.0	62.0	60.0	30.0
NICE-L-C-4030F				

System Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Applicable Motor (kW)
NICE-L-C-4037	57.0	77.0	75.0	37.0
NICE-L-C-4037F				
NICE-L-C-4045	69.0	93.0	91.0	45.0
NICE-L-C-4045F				
NICE-L-C-4055	85.0	113.0	112.0	55.0
NICE-L-C-4055F				
NICE-L-C-4075	114.0	157.5	150.0	75.0
NICE-L-C-4075F				
NICE-L-C-4090	134.0	180.0	176.0	90.0
NICE-L-C-4110	160.0	214.0	210.0	110.0
NICE-L-C-4132	192.0	256.0	253.0	132.0
NICE-L-C-4160	231.0	307.0	304.0	160.0

3.3 Options

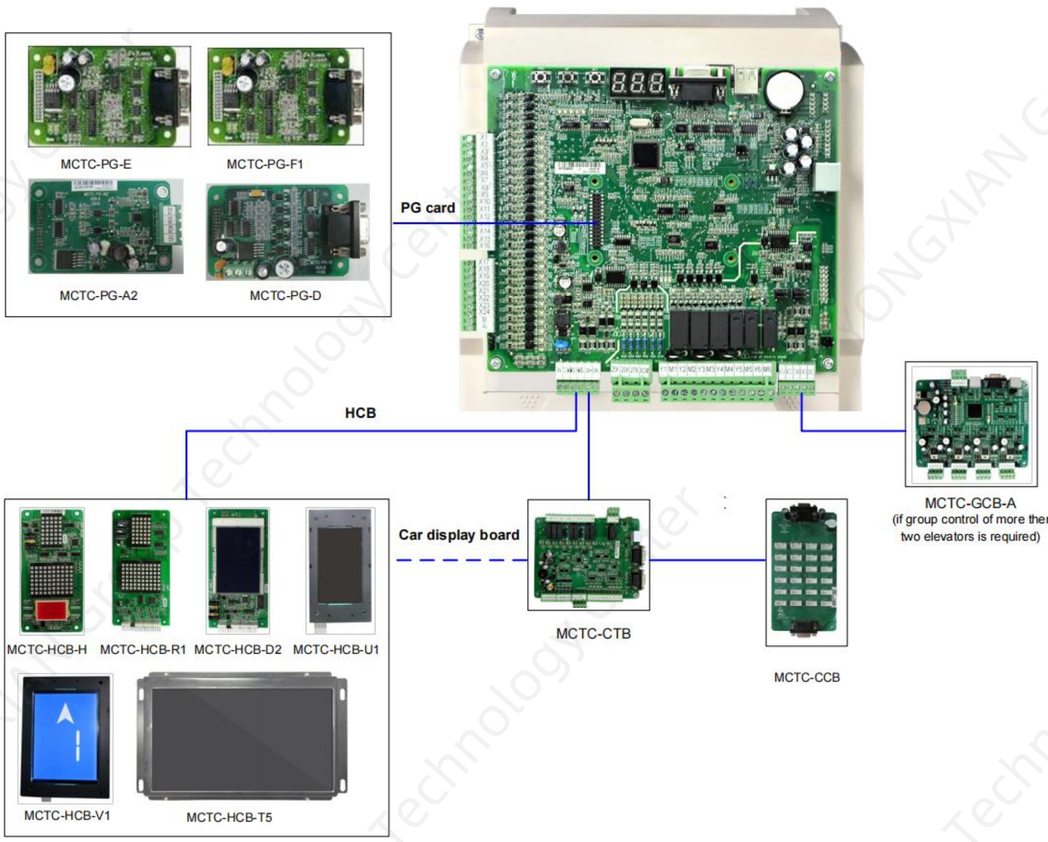


Figure 3-19 Schematic diagram of options connection

3.3.1 List of Options

If any optional in the following table is required, specify it in your order.

Table 3-22 Options of the NICE3000^{new}

Name	Model	Function
External braking unit	MDBUN	It is provided for the models of 37 kW (F model 45 kW) and above.
PG card	MCTC-PG-A2	It is used to adapt to the push-pull and open-collector incremental encoders.
	MCTC-PG-D	It is used to adapt to the UVW or ABZ differential signal encoder for the 5 V power supply.
	MCTC-PG-E	It is used to adapt to the SIN/COS encoder-ERN1387/Weton SC53.
	MCTC-PG-F1	It is used to adapt to the absolute encoder (Endat: ECN413/1313).
	MCTC-PG-F2	Communication encoder (Weton EA53)
Car top board (CTB)	MCTC-CTB	The MCTC-CTB is the car control board of the NICE3000^{new}. It has 8 DIs, 1 AI and 7 relay outputs (9 as non-standard configuration). It can communicate with the CCB and HCB simultaneously.
Hall call board (HCB)	MCTC-HCB	The HCB receives the passenger calls and displays the floor where the elevator is located and the running direction. It can also be used as car display board.
Car call board (CCB)	MCTC-CCB	The MCTC-CCB is another interface for passengers to interact with the control system. It mainly collects the car calls and outputs the call indicator state.
Group control board (GCB)	MCTC-GCB-A	The MCTC-GCB is used together with the NICE3000^{new} to implement group control of up to 8 elevators.
I/O expansion card	MCTC-KZ-G1	If the control board or hall I/O terminals are not sufficient, more terminals can be provided by using MCTC-KZ-G1.
MIB	MCTC-MIB-A	The MCTC-MIB-A is used to query information such as elevator running state, current floor, and faults, and send the information to the monitoring room via communication. Users can monitor and control the elevator by using the PC installed with the monitoring software in the monitoring room.
External LED operation panel	MDKE	It is the external LED display and operation panel. It provides the RJ45 interface.
Extension cable	MDCAB	It is a standard 8-core network cable and can be connected to MDKE and MDKE6. The cable length is 3 m in the standard configuration.

3.3.2 Car Top Board (MCTC-CTB)

The Car Top Board (MCTC-CTB) is the car control board of the NICE3000^{new}, also called CTB. It has 8 DIs, 1 AI and 7 relay outputs (9 as non-standard configuration). It can communicate with the CCB and HCB simultaneously.

1 Appearance and dimensions and mounting method

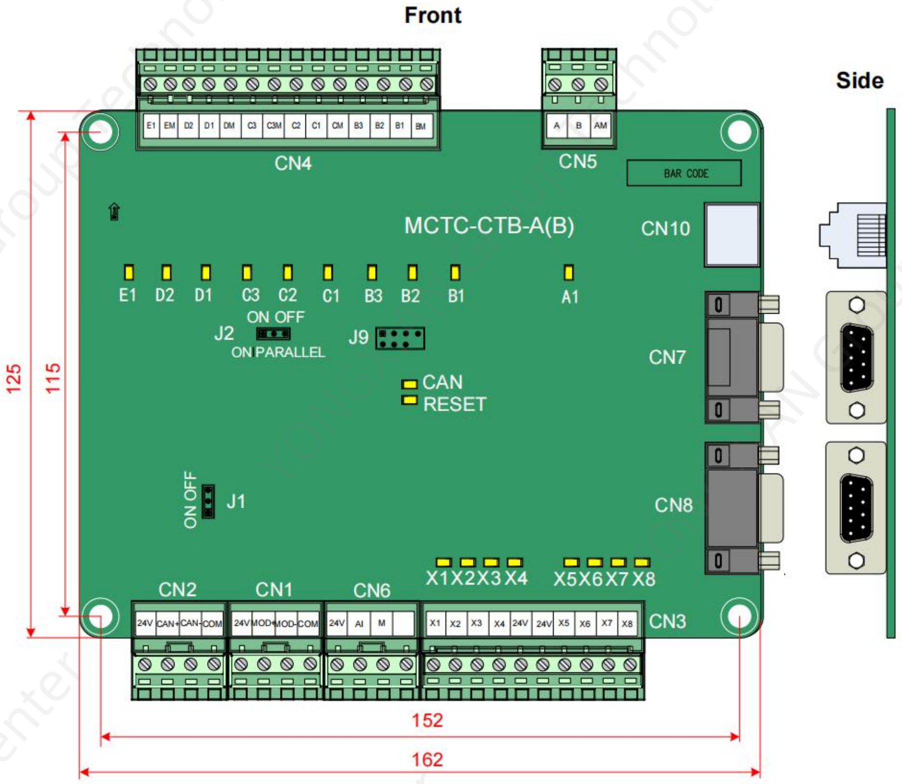


Figure 3-20 Appearance and dimensions of the CTB (unit: mm)

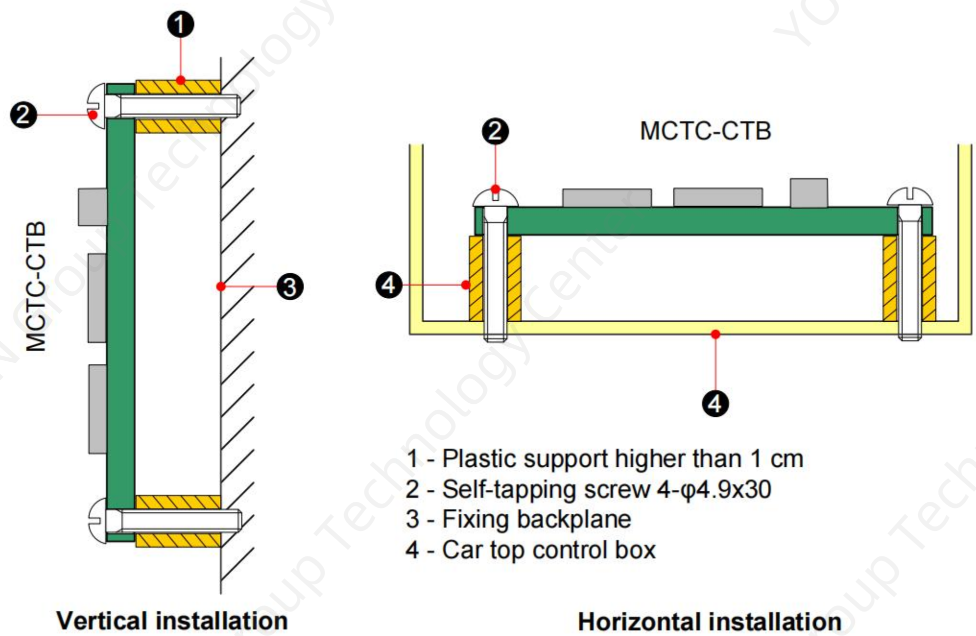
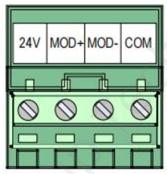
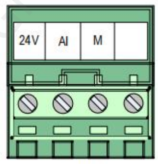
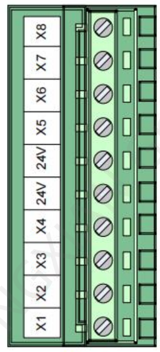
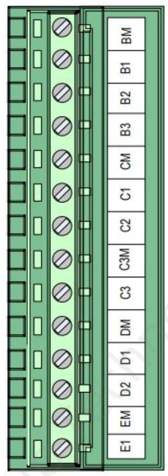
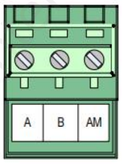
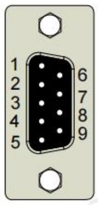
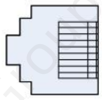
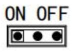
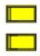
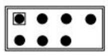


Figure 3-21 Mounting method of the CTB (unit: mm)

2 Connection between MCTC-PG and encoder

Table 3-23 Table 3-8 Description and wiring of CTB terminals

Terminal ID		Terminal Name	Function description	Terminal Layout
CN2	+24V/COM	External 24 VDC power supply	24 VDC power supply for the entire CTB	 CN2
	CAN+/CAN-	CANbus communication interface	Connecting the MCB for CANbus communication	
CN1	+24V/COM	24 VDC power supply	24 VDC power supply for the HCB	 CN1
	MOD+/ MOD-	Modbus communication interface	Connecting the HCB for Modbus communication	
CN6	AI-M	Load cell signal input	Input voltage range: 0VDC to 10VDC	 CN6
CN3	24V	+24V power supply	DI common terminal	 CN3
	X1	Light curtain 1	DI terminal 1. Photocoupler isolation, unipolarity input 2. Input impedance: 3.3 kΩ Signals of the CTB are active when there is 24 VDC power supply.	
	X2	Light curtain 2		
	X3	Door open limit 1		
	X4	Door open limit 2		
	X5	Door close limit 1		
	X6	Door close limit 2		
	X7	Full-load signal (100%)		
	X8	Overload signal (110%)		
CN4	B1-BM	Door open signal 1	Relay output terminal Contact drive capacity: 30 VDC, 1 A	 CN4
	B2-BM	Door close signal 1		
	B3-BM	Forced door close 1		
	C1-CM	Door open signal 2		
	C2-CM	Door close signal 2		
	C3-C3M	Forced door close 2		
	D1-DM	Up arrival signal		
	D2-DM	Down arrival signal		
	E1-EM	Audible and visual alarm		

Terminal ID	Terminal Name	Function description	Terminal Layout
CN5: A-AM (NC contact) B-AM (NO contact)	Car fan and lamp control	Relay output terminal Contact drive capacity: 250 VAC, 3 A or 30 VDC, 1 A	 CN5
CN7/CN8	DB9-pin port for communication with the CCB	Connecting the CCB CN7 mainly used for front door and ordinary calls CN8 mainly used for back door and disability calls	 CN7/CN8
CN10	RJ45 interface	Connecting the external LED keypad or LCD operation panel	 CN10
J2	CTB address jumper in parallel control	Setting the CTB addresses: Short OFF or do not connect the terminal for a single elevator.	 J2
CAN	CANbus communication indicator	This indicator blinks when communication between the CTB and the MCB is normal, and is steady on when a communication fault occurs.	 CAN RESET
RESET	CANbus communication fault indicator	This indicator blinks and the CANbus communication indicator is steady on when a fault occurs during communication between the CTB and the MCB	
X1 to X8	DI indicator	This indicator is on (green) when the external input is active.	
A1 to E1	Relay output indicator	This indicator is on (green) when the system output is active.	
J9	Reserved	Factory reserved. Do not short it randomly. Otherwise, the controller may not work properly.	 J9

NOTE

- ◆ To prevent external interference on the communication, you are advised to use the shielded twisted pair as communication cables and lay them parallel.
- ◆ Connect cables to the terminals according to the terminal marks, and fix the cables well.

3.3.3 Display Board (MCTC-HCB)

As an important interface between users and the control system, the MCTC-HCB receives hall calls and displays the current floor and running direction for the hall. This board can also be used as car display board.

Inovance provides many types of display boards. The following part describes only two common types. If the types available cannot meet your requirements, you can use a parallel-serial conversion board (HCB-B)

to make the board provided match your own. For any further requirement, refer to the MCTC-HCB Display Board Selection Manual with data code 19010457.

Table 3-24 Common MCTC-HCB types

Name	Description	Size (mm)
MCTC-HCB-H	Dot-matrix display board (red)	144 × 70 × 18
MCTC-HCB-R1	Ultrathin dot-matrix display board (red)	144 × 70 × 10

MCTC-HCB-H: Dot-matrix display board

■ Appearance and dimensions

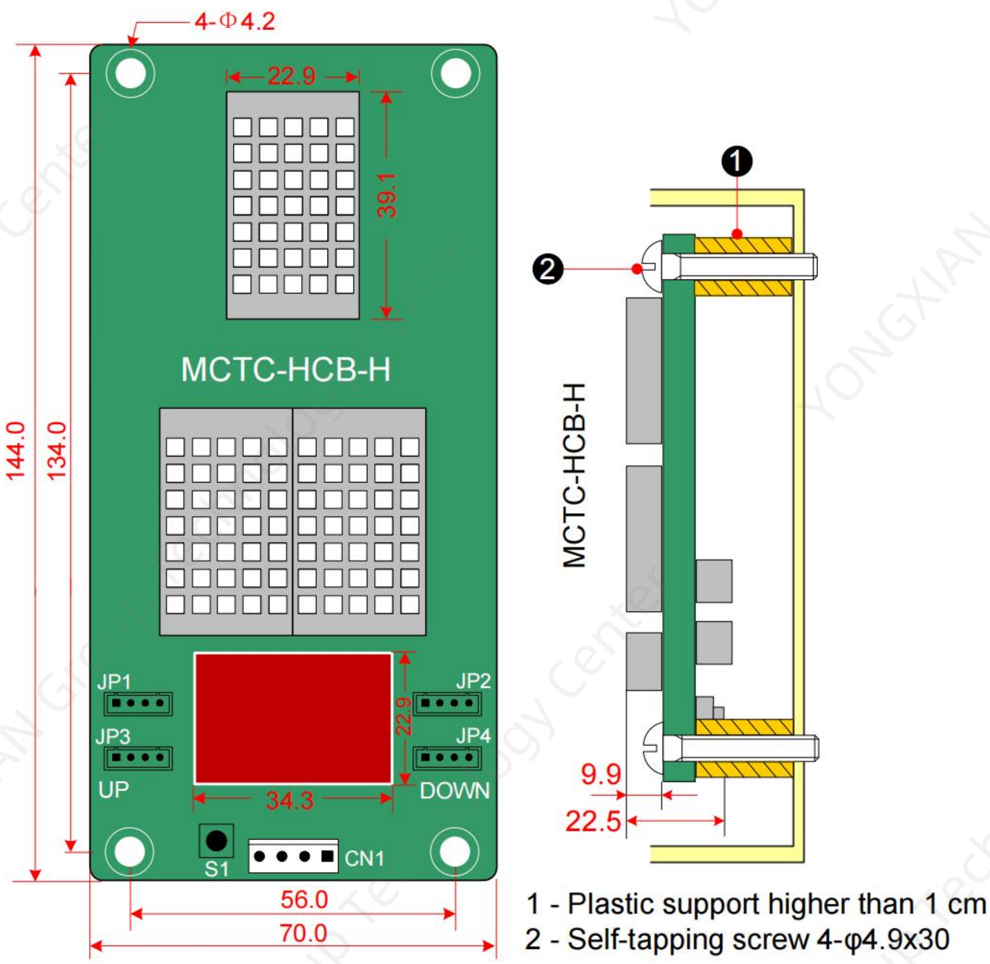
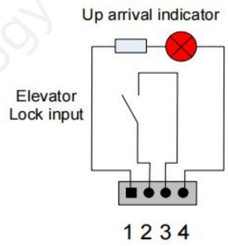
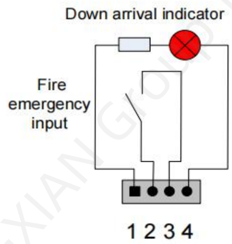
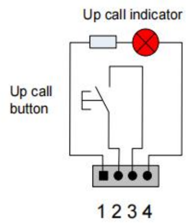
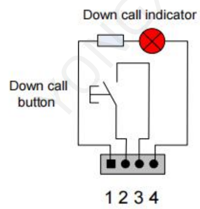
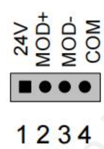


Figure 3-22 Appearance, dimensions, and installation method of MCTC-HCB-H

■ Description of terminals

Table 3-26 Input and output terminals of HCB-H

Terminal Name	Function	Connection between MCTC-PG and encoder
JP1	Interface for the elevator lock switch Pins 2 and 3 are for switch input. Pins 1 and 4 are output of the up arrival indicator (24 VDC output, load capacity: 40 mA).	
JP2	Interface for the fire emergency switch Pins 2 and 3 are for switch input. Pins 1 and 4 are output of the down arrival indicator (24 VDC output, load capacity: 40 mA).	
JP3	Interface for the up call button Pins 2 and 3 are for up call input. Pins 1 and 4 are power supply for the up call indicator (24 VDC output, load capacity: 40 mA).	
JP4	Interface for the down call button Pins 2 and 3 are for down call input. Pins 1 and 4 are power supply for the down call indicator (24 VDC output, load capacity: 40 mA).	
S1	Button for setting the floor address Hold down the button to adjust the floor address (range 0–56). After you stop pressing, the address number blinks three times and the setting is successful.	
CN1	Modbus communication and power supply terminal Pins 2 and 3 are for Modbus communication. Pins 1 and 4 are for power supply.	

3 MCTC-HCB-R1: Ultrathin dot-matrix display board

■ Appearance and dimensions

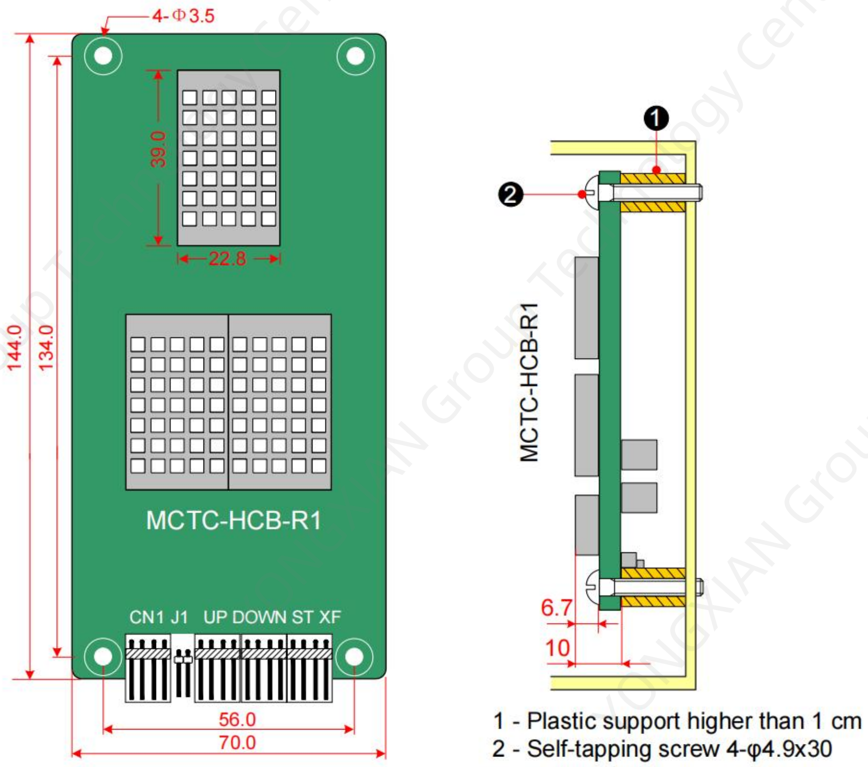
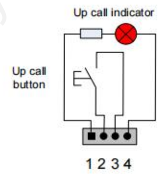
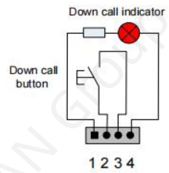
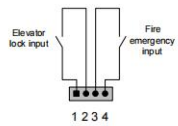
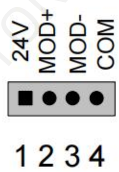


Figure 3-23 Appearance, dimensions, and installation method of MCTC-HCB-R1

■ Description of terminals

Table 3-27 Input and output terminals of HCB-H

Terminal Name	Function	Connection between MCTC-PG and encoder
UP	Interface for the up call button Pins 2 and 3 are for up call input. Pins 1 and 4 are power supply for the up call indicator (24 VDC output, load capacity: 40 mA).	
DOWN	Interface for the down call button Pins 2 and 3 are for down call input. Pins 1 and 4 are power supply for the down call indicator (24 VDC output, load capacity: 40 mA).	
XF/ST	Interface for the fire emergency and elevator lock switches Pins 1 and 2 are for elevator lock input. Pins 3 and 4 are for fire emergency input.	
J1	Terminal for setting the floor address Short J1, and press the UP button or DOWN button to set the floor address (range 0–56). After the jumper cap is removed, the address is automatically stored.	
CN1	Modbus communication and power supply terminal Pins 2 and 3 are for Modbus communication. Pins 1 and 4 are for power supply.	

3.3.4 Car Call Board (MCTC-CCB)

The car call board (MCTC-CCB) is another interface between users and the control system, also called CCB. Each CCB comprises 24 inputs and 22 outputs, including 16 floor buttons and 8 functional signals. The CCB mainly collects button calls and outputs signals of the button call indicators. The need for 40-floor use can be implemented through cascaded connection. CN2 is an input connector and CN1 is a cascaded output connector.

1 Appearance and dimensions

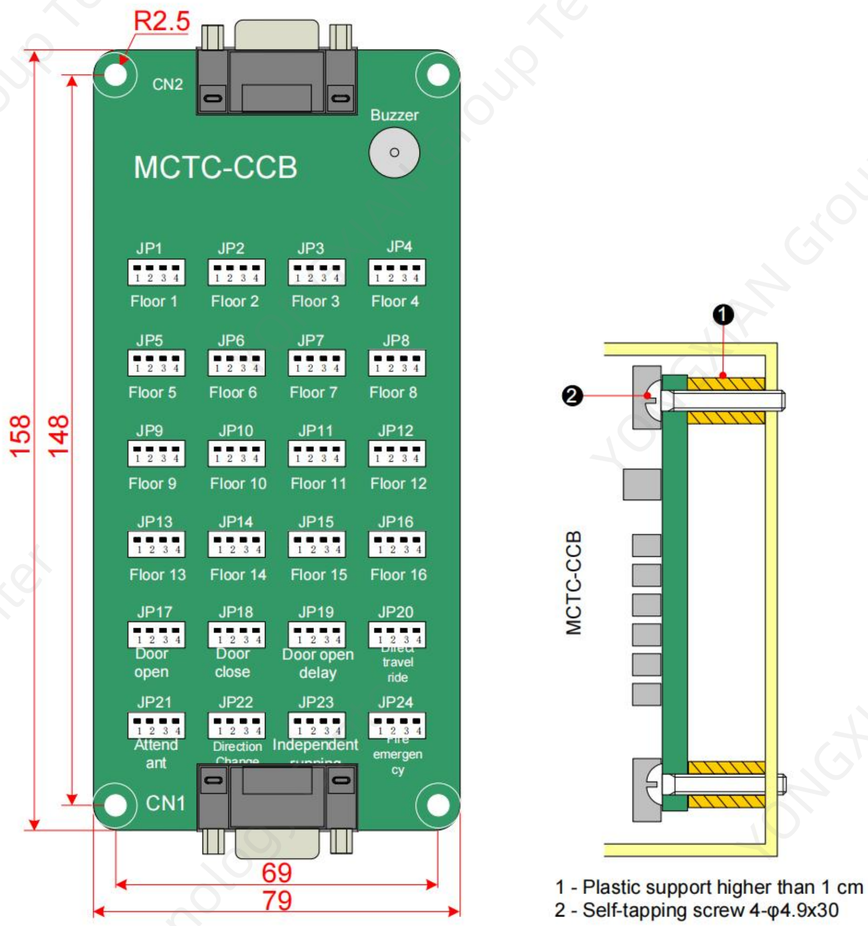
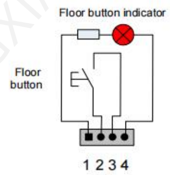


Figure 3-24 Appearance, structure and installation method of the CCB

2 Description of terminals

Table 3-28 Description and wiring of CCB terminals

<table>
<tr><th>No.</th><th>Interface</th><th>Pins 2 and 3</th><th>Pins 1 and 4</th><th>Connection between MCTC-PG and encoder</th></tr>
<tr><td>1</td><td>JP1</td><td>Floor 1 button input</td><td>Floor 1 display output</td><td rowspan="16">

For CCB2, the input signal of JPn corresponds to floor (16+n) button input.</td></tr>
<tr><td>2</td><td>JP2</td><td>Floor 2 button input</td><td>Floor 2 display output</td></tr>
<tr><td>3</td><td>JP3</td><td>Floor 3 button input</td><td>Floor 3 display output</td></tr>
<tr><td>4</td><td>JP4</td><td>Floor 4 button input</td><td>Floor 4 display output</td></tr>
<tr><td>5</td><td>JP5</td><td>Floor 5 button input</td><td>Floor 5 display output</td></tr>
<tr><td>6</td><td>JP6</td><td>Floor 6 button input</td><td>Floor 6 display output</td></tr>
<tr><td>7</td><td>JP7</td><td>Floor 7 button input</td><td>Floor 7 display output</td></tr>
<tr><td>8</td><td>JP8</td><td>Floor 8 button input</td><td>Floor 8 display output</td></tr>
<tr><td>9</td><td>JP9</td><td>Floor 9 button input</td><td>Floor 9 display output</td></tr>
<tr><td>10</td><td>JP10</td><td>Floor 10 button input</td><td>Floor 10 display output</td></tr>
<tr><td>11</td><td>JP11</td><td>Floor 11 button input</td><td>Floor 11 display output</td></tr>
<tr><td>12</td><td>JP12</td><td>Floor 12 button input</td><td>Floor 12 display output</td></tr>
<tr><td>13</td><td>JP13</td><td>Floor 13 button input</td><td>Floor 13 display output</td></tr>
<tr><td>14</td><td>JP14</td><td>Floor 14 button input</td><td>Floor 14 display output</td></tr>
<tr><td>15</td><td>JP15</td><td>Floor 15 button input</td><td>Floor 15 display output</td></tr>
<tr><td>16</td><td>JP16</td><td>Floor 16 button input</td><td>Floor 16 display output</td></tr>
</table>

<table>
<tr><th>No.</th><th>Interface</th><th>Pins 2 and 3</th><th>Pins 1 and 4</th><th>Connection between MCTC-PG and encoder</th></tr>
<tr><td>17</td><td>JP17</td><td>Door open button input</td><td>Door open display output</td><td rowspan="8">When the CCB is used as a cascaded CCB, this type of terminals is invalid. When the cascaded CCB is used for back door control, JP17 can be used to implement back door open.</td></tr>
<tr><td>18</td><td>JP18</td><td>Door close button input</td><td>Door close display output</td></tr>
<tr><td>19</td><td>JP19</td><td>Door open delay button input</td><td>Door open delay display output</td></tr>
<tr><td>20</td><td>JP20</td><td>Direct travel ride input</td><td>Non-door zone stop output</td></tr>
<tr><td>21</td><td>JP21</td><td>Attendant input</td><td>Reserved</td></tr>
<tr><td>22</td><td>JP22</td><td>Direction change input</td><td>Reserved</td></tr>
<tr><td>23</td><td>JP23</td><td>Independent running input</td><td>Reserved</td></tr>
<tr><td>24</td><td>JP24</td><td>Fire emergency input</td><td>Reserved</td></tr>
<tr><td colspan="5">Note: Pins 1 and 2 are positive of power supply. The pin with white dot mark or that is rectangular is pin 1.</td></tr>
</table>

NOTE

- Perform wiring strictly according to the terminal marks and ensure that the button is inserted securely.
- The MCTC-CCB has the same interfaces on both ends, and do not make wrong connection when connecting multiple boards in series.

3.3.5 Group Control Board (MCTC-GCB-A)

A single group control board (GCB) (standard program) supports group control of 4 elevators, with a maximum of 40 floors.

Combination of two GCBs (customized program) supports group control of 5 to 8 elevators, with a maximum of 40 floors; for details on the customized program, contact us.

1 Appearance and dimensions

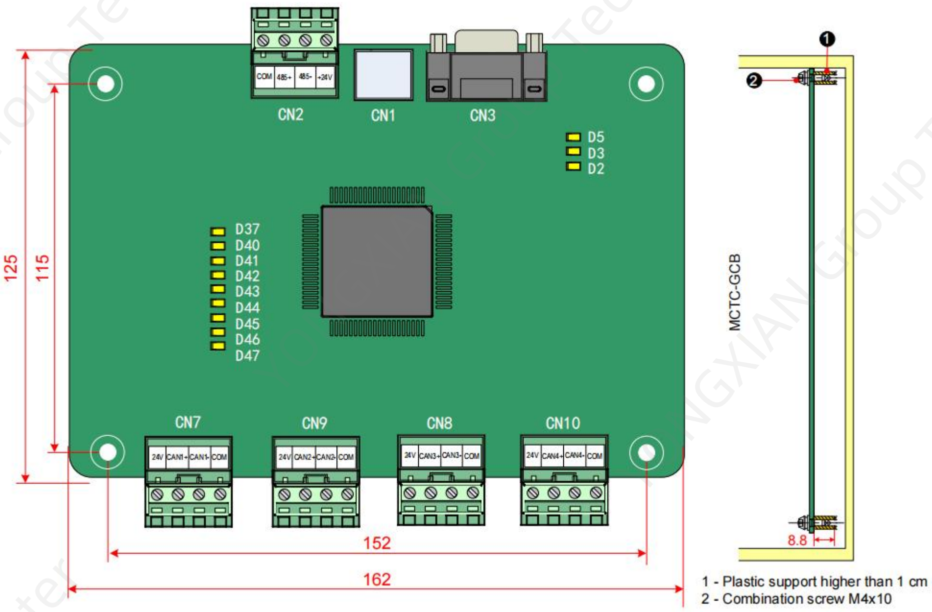
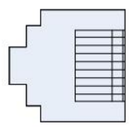
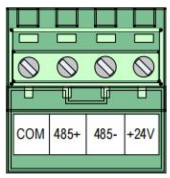
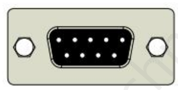
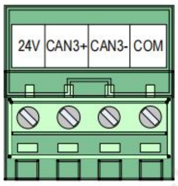
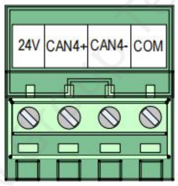


Figure 3-25 Appearance, dimensions, and installation method of the MCTC-GCB-A

2 Description of terminals

Table 3-29 Input and output terminals of the MCTC-GCB

Terminal ID		Terminal Name	Function description	Terminal Layout
CN1	-	Operation panel terminal	Connecting the operation panel	
CN2	+24V/ COM	24 VDC power supply	External 24 VDC power supply for the entire GCB	
	MOD+/ MOD-	Modbus communication terminal	LCD display and extension functions	
CN3	-	RS232 Interface	Communicating with the host computer or IE card	
CN7	+24V/ COM	External 24 VDC power supply	24 VDC power supply for the corresponding CANbus communication module	
	CAN1+/ CAN1-	CANbus communication terminal	CANbus communication between the GCB and the MCB of elevator 1 in group control	

Terminal ID		Terminal Name	Function description	Terminal Layout
CN9	+24V/ COM	External 24 VDC power supply	24 VDC power supply for the corresponding CANbus communication module	
	CAN2+/ CAN2-	CANbus communication terminal	CANbus communication between the GCB and the MCB of elevator 2 in group control	
CN8	+24V/ COM	External 24 VDC power supply	24 VDC power supply for the corresponding CANbus communication module	
	CAN3+/ CAN3-	CANbus communication terminal	CANbus communication between the GCB and the MCB of elevator 3 in group control	
CN10	+24V/ COM	External 24 VDC power supply	24 VDC power supply for the corresponding CANbus communication module	
	CAN4+/ CAN4-	CANbus communication terminal	CANbus communication between the GCB and the MCB of elevator 4 in group control	

3.3.6 I/O Expansion Board (MCTC-KZ-G1)

The expansion board (MCTC-KZ-G1) has one RS458 interface, one CANbus communication interface, ten DI and ten DO terminals. The expansion board is connected to the CAN1 bus of the control board via the CANbus interface to implement I/O terminal expansion. The CAN1 bus supports up to two expansion boards, one of which is placed in the equipment room and the other at the top of the car. The DIP switch on the expansion board is used to set an address. When all switches are OFF, this board is at the top of the car. When switch 1 is in 1 position, this board is in the equipment room. The terminals of the expansion board are allocated with functions in FD-11 to 50.

1 Appearance and dimensions

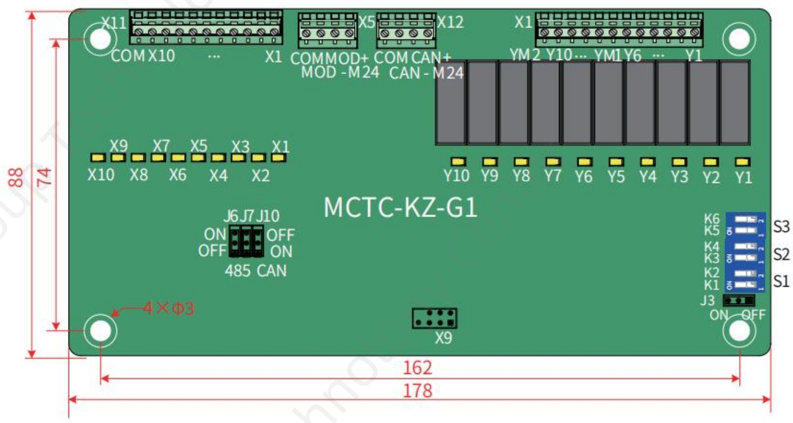
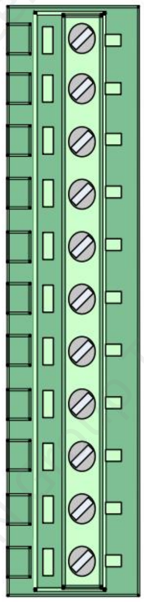
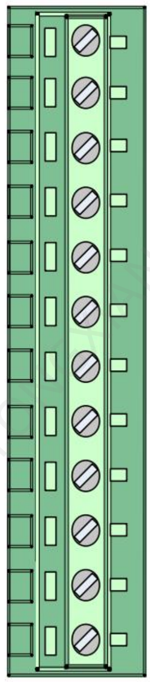
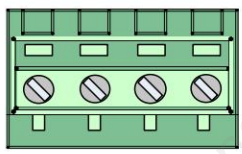
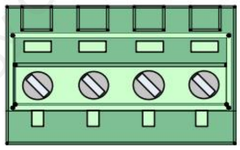
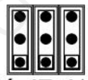
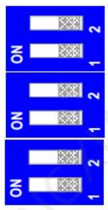
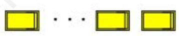
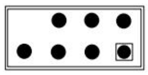


Figure 3-26 Appearance and dimensions of the MCTC-KZ-G1 (unit: mm)

2. Port description

Table 3-30 Terminals of the MCTC-KZ-G1

Terminal ID		Terminal Name	Function description	Terminal Layout
Terminal X11	X1	DI 1	DI Rated voltage: 30 V Rated current: 5 mA	
	X2	DI 2		
	X3	DI 3		
	X4	DI 4		
	X5	DI 5		
	X6	DI 6		
	X7	DI 7		
	X8	DI 8		
	X9	DI 9		
	X10	DI 10		
	M24V	External 24 V power output		
Terminal X1	Y1	Relay output Y1	Relay output terminal Contact current capacity: 250 VAC, 5 A	
	Y2	Relay output Y2		
	Y3	Relay output Y3		
	Y4	Relay output Y4		
	Y5	Relay output Y5		
	Y6	Relay output Y6		
	YM1	Reference ground of relay outputs Y1 to Y6		
	Y7	Relay output Y7		
	Y8	Relay output Y8		
	Y9	Relay output Y9		
	Y10	Relay output Y10		
	YM2	Reference ground of relay outputs Y7 to Y10		
Terminal X12	+24V/COM	External 24 VDC power supply	External 24 V power supply	
	CAN+/ CAN-	Reserved CAN communication port	Connecting the MCB for CANbus communication	

Terminal ID		Terminal Name	Function description	Terminal Layout
Terminal X5	+24V/COM	24 VDC power supply	External 24 V power supply	
	MOD+/ MOD-	RS485 communication interface with the MCB	This interface is reserved when the expansion board is placed at the top of the car. When the extension board is installed in the equipment room, one signal can be used for calls of the back door, implementing opposite door control of all 40 floors.	
J6/J7		MOD termination resistor jumper pin	When Modbus communication is used, J6/J7 is shorted to the ON pin to connect a matching resistor.	 J6 J7 J10
J10		CAN termination resistor jumper pin	When CANbus communication is used, J10 is shorted to the ON pin to connect a matching resistor.	
J3		Reserved	Factory reserved	 J3
S1/S2/S3		Address DIP switch	These switches are used to set an expansion type. When all switches are OFF, this board is on top of the car. When K1 is in ON position, this board is in the equipment room.	 S3 S2 S1
X1 to X10		DI indicator	This indicator is on (green) when the external input is active.	 X10 ··· X2 X1
Y1 to Y10		Relay output indicator	This indicator is on (green) when the system output is active.	 Y10 ··· Y2 Y1
Terminal X9		Reserved	Factory reserved. Do not short it randomly. Otherwise, the controller may not work properly.	

3.3.7 Residential Monitoring Board (MCTC-MIB-A)

The MCTC-MIB-A is used to query information such as elevator running state, current floor, and faults, and send the information to the monitoring room via communication. Users can monitor and control the elevator by using the PC installed with the monitoring software in the monitoring room.

The MCTC-MIB-A has one RS458 interface and one RS232 communication interface, corresponding signal indicator, and keypad RJ45 interface. The RS232 port is connected to the controller or PC host computer, according to the parameter setting. The RS485 port is connected to the RS485 port of other MCTC-MIB-A.

1 Appearance and dimensions

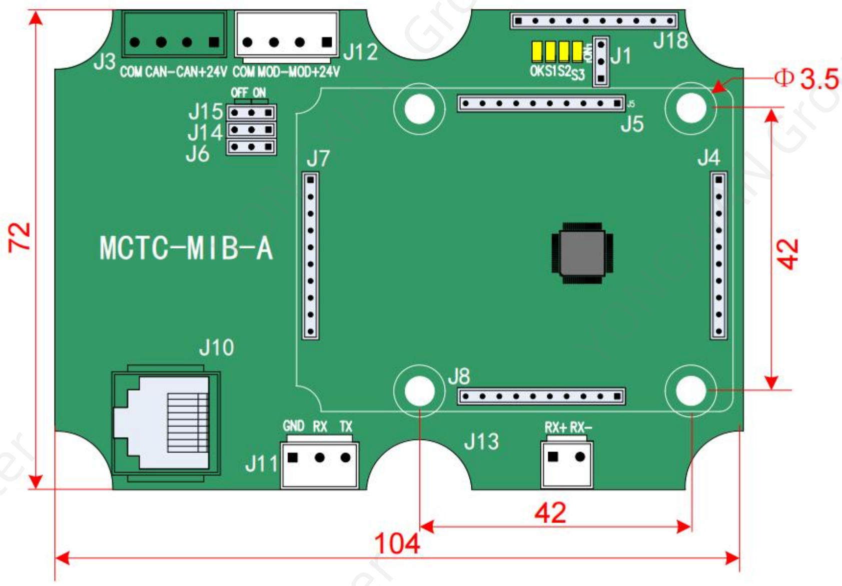
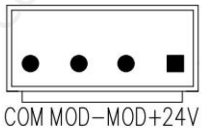
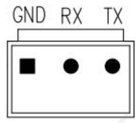
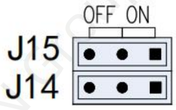
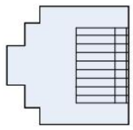
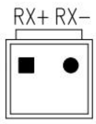


Figure 3-27 Appearance and dimensions of MCTC-MIB-A (unit: mm)

2 Description of terminals

Table 3-31 Description of MCTC-MIB-A terminals

Terminal ID		Terminal Name	Function description	Terminal Layout
J12	+24V/COM	External 24 VDC power supply	External 24 V power supply	
	MOD+/MOD-	RS485 communication interface	Connecting the MIB in the monitoring room for RS485 communication	
J11	TX/RX	RS232 communication	Burning program disconnection/ Communication interface with the PC host computer/ Communication interface with the controller	
	GND	GND interface		
J14/J15		Matching resistor	The board terminal in the monitoring room is connected to part 1. The board terminal in the equipment room is connected to part 2 (by default).	
J4/J7		GSM module	Connecting the short message GSM module	
J5/J8		Zigbee module	Reserved	
J1		Burning jumper	ON: The jumper is active and enters the download mode.	
J10		Operation panel interface	Connecting the operation panel	
J3		Reserved	-	
J13		Reserved	-	
J6		Reserved	-	

Terminal ID	Terminal Name	Function description	Terminal Layout
OK	Power indicator	The indicator blinks when the board power supply and the single chip operate normally.	
S1	Communication indicator with the controller	The indicator blinks when communication with the controller is normal.	
S2	Communication networking indicator with RS485	The indicator blinks when communication networking with RS485 is normal.	
S3	Communication indicator with the host computer	The indicator blinks when communication with the host computer is normal.	

3.3.8 MCTC-PG Card

The NICE3000^{new} can implement CLVC only with use of the MCTC-PG card. The following figure shows the appearance of the MCTC-PG card and its installation on the controller. Directly insert the J1 terminal of the MCTC-PG card into the J12 terminal of the controller.

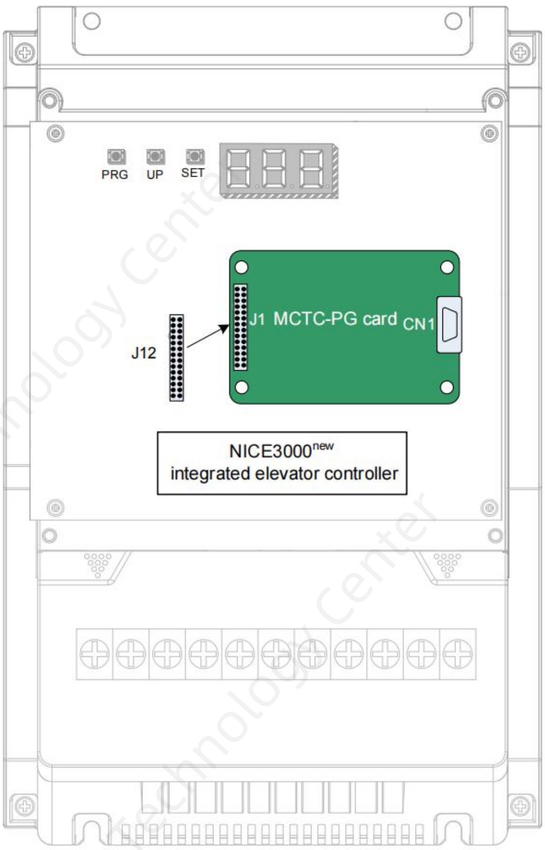
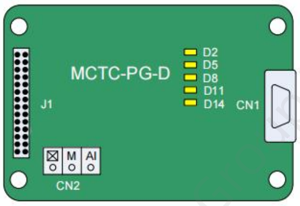


Figure 3-28 Appearance of the MCTC-PG card and its installation on the controller

■ Classification of MCTC-PG cards

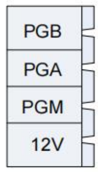
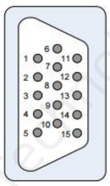
We provides four PG card models, MCTC-PG-A2, MCTC-PG-D, MCTC-PG-E and MCTC-PG-F1 for different encoder types, as described in the following table.

Table 3-32 Selection of the MCTC-PG card models

Encoder Type	Applicable PG Card	Appearance
It is used to adapt to the push-pull and open-collector incremental encoders.	MCTC-PG-A2	
UVW encoder	MCTC-PG-D	
SIN/COS encoder	MCTC-PG-E	
Absolute encoder (ECN413/1313)	MCTC-PG-F1	

3 Description of terminals

Table 3-33 Definitions of the CN1 terminals of different MCTC-PG card models

PG card Type	Pin Definition															CN1 Terminal Layout
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
MCTC-PG-A2	12V	PGM	PGA	PGB	-	-	-	-	-	-	-	-	-	-	-	
MCTC-PG-D	A+	A-	B+	B-	Empty	Empty	U+	U-	V+	V-	W+	W-	VCC	COM	Empty	
MCTC-PG-E	B-	Empty	Z+	Z-	A+	A-	COM	B+	VCC	C+	C-	D+	D-	Empty	Empty	
MCTC-PG-F1	B-	Empty	Empty	Empty	A+	A-	GND	B+	5V (UP)	CLK+	CLK-	DATA+	DATA-	Empty	5 V (Sensor)	

4 Description of wiring

■ Connection between MCTC-PG-E and encoder ERN1387

A speed closed-loop vector system is formed by connecting the J1 terminal and CN1 terminal of the MCTC-PG card to the J12 terminal of the MCB on the NICE3000^{new} and the encoder of the motor traction machine respectively. Different MCTC-PG card models are connected to the MCB in the same way. The connection method to the encoder depends on the CN1 terminal of the model.

The following figure shows connection between MCTC-PG-E and encoder ERN1387.

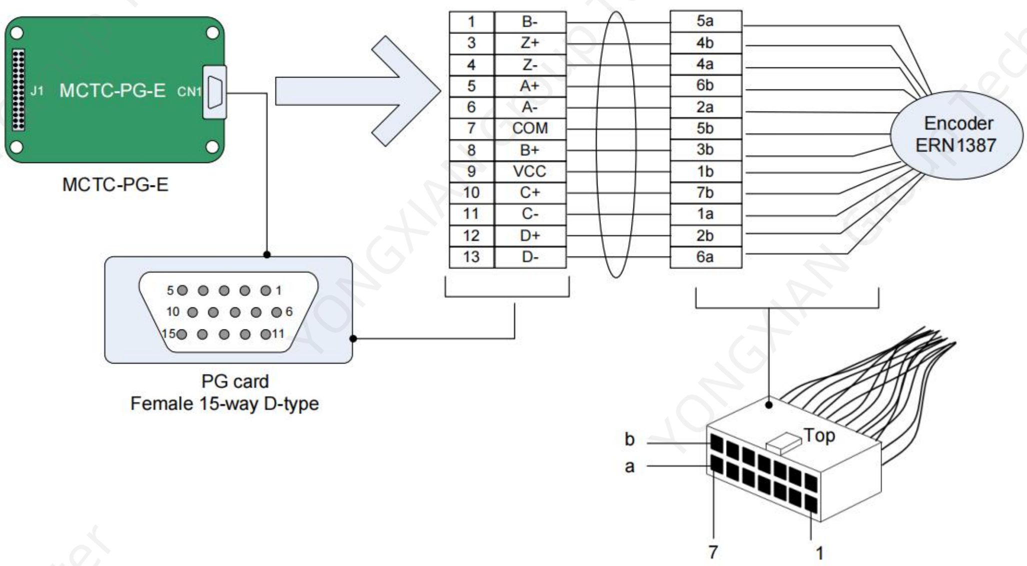


Figure 3-29 Connection between MCTC-PG-E and encoder ERN1387

■ Terminal definition of ERN1387

Signal	C-	A-	0V Thermistor	R-	B-	D-	Up Thermistor	VCC	D+	B+	R+	0V	A+	C+
Encoder Terminal	1a	2a	3a	4a	5a	6a	7a	1b	2b	3b	4b	5b	6b	7b

■ Connection between MCTC-PG-F1 and encoder ERN1313

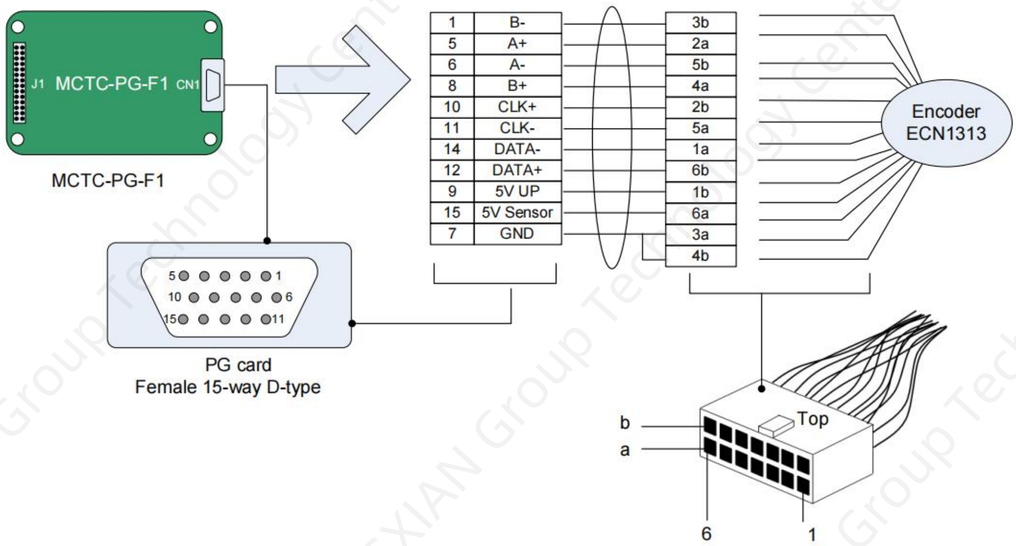


Figure 3-30 Connection between the PG card and encoder ERN1313

Table 3-34 Terminal definition of ECN1313

Signal	DATA-	A+	GND	B+	CLK-	5V (Sensor)	5V (UP)	CLK+	B-	GND	A-	DATA+
Encoder Terminal	1a	2a	3a	4a	5a	6a	1b	2b	3b	4b	5b	6b

NOTE

Precautions on connecting PG card:

◆ The cable from the PG card to the encoder must be separated from the cables of the control circuit and the main circuit. Parallel cabling with close distance is forbidden.

◆ The cable from the PG card to the encoder must be a shielded cable. The shield must be connected to the PE on the controller side. To minimize interference, single-end grounding is suggested.

◆ The cable from the MCTC-PG card to the encoder must run through a separate duct and the metal shell is reliably grounded.

4 Commissioning Tools

The NICE3000[new] supports four commissioning tools: onboard 3-button keypad (hereinafter called the “keypad”), LED operation and information display panel (hereinafter called the “operation panel”), host computer monitoring software, and cell phone commissioning software.

Tool	Function Description	Remarks
Keypad	It is used to enter the shaft commissioning commands and view floor information.	Standard
LED operation panel (MDKE)	It is used to view and modify parameters related to elevator drive and control.	Optional
LED operation panel (MDKE6)	It is used to upload, download, view, and modify controller parameters.	Optional
Cell phone commissioning software (EDSAP)	An external WIFI module is used to connect the MCB and the smartphone installed with the commissioning software, through which you can commission the elevator, and upload and download parameters.	Optional

The following part describes the commonly used keypad and LED operation panel (MDKE) in detail.

4.1 Keypad

The keypad consists of three LEDs and three buttons. You can view information about the controller and enter simple commands on the keypad.

The following figure shows the appearance of the keypad.

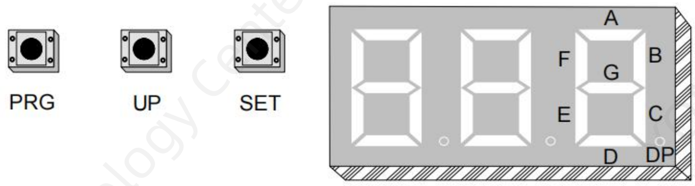


Figure 4-1 Appearance of the keypad

As shown in the preceding figure, the three buttons are PRG, UP, and SET. The functions of the three buttons are described in the following table.

Button	Function
PRG	◆ Press this button in any state to display the current function group number and exit the current operation.
UP	◆ Press this button to increase the function group number or data. ◆ In group F6 menu, this button is used to input the door open command.
SET	◆ Enter the function menu edit mode; confirm and save the current operation. ◆ In group F6 menu, this button is used to input the door close command.

Figure 4-2 shows the setting of increasing the called floor to 4.

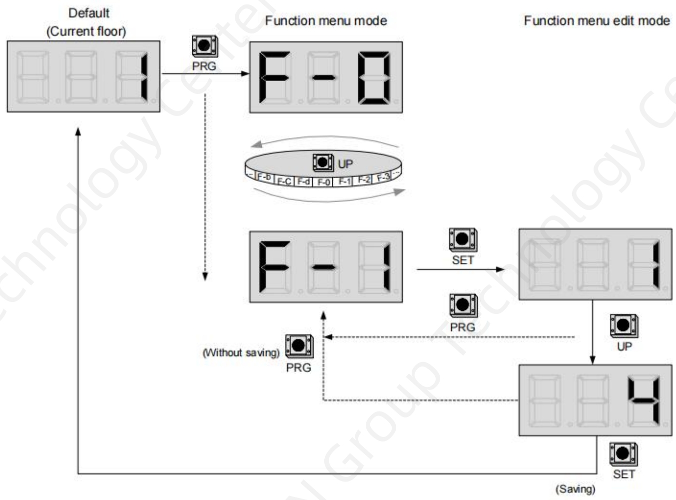


Figure 4-2 Setting the called floor

For the function menus displayed on the keypad, refer to 6.1 Keypad.

4.2 Operation Panel

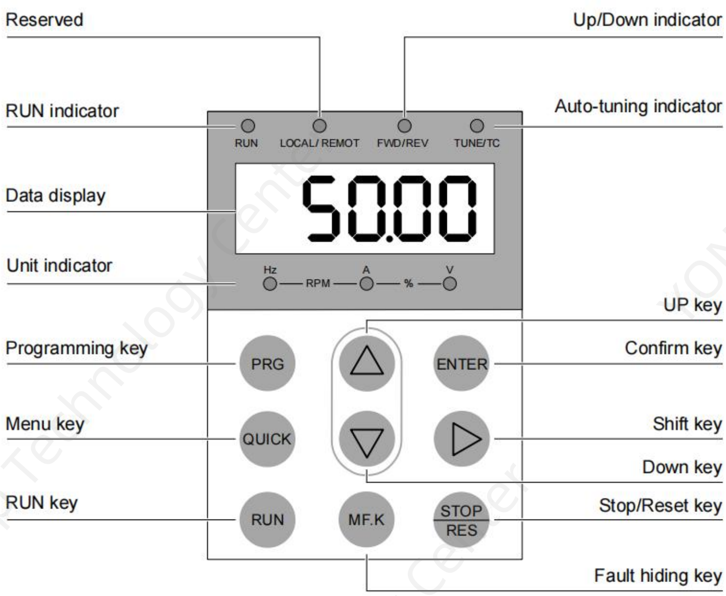


Figure 4-3 Diagram of the LED operation panel

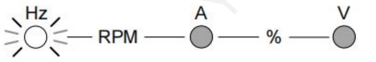
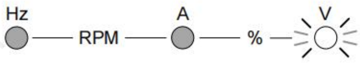
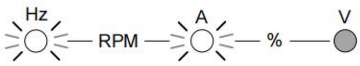
4.2.1 Description of Keys

Button	Name	Function
PRG	Programming	Enter or exit the Level I menu.
ENTER	Enter	Enter each level of menu interface. Confirm the parameter setting.
△	Up	Increase the data or parameter.
▽	Down	Decrease the data or parameter.
▷	Shift	Select the displayed parameters in turn in the stop or running state. Select the digit to be modified when modifying a parameter value.
RUN	RUN	Start the controller in the operation panel control mode.
STOP/RES	Stop/Reset	Stop the controller when it is in the RUN state. Perform a reset operation when the controller is in the FAULT state.
MF.K	Fault hiding	Display or hide the fault information in the fault state, which facilitates parameter viewing.
QUICK	Quick	Enter or exit Level-I quick menu.

4.2.2 Indicators

 in the following table indicates ON;  indicates OFF;  indicates flash.

Table 4-1 Description of indicators on the operation panel

Indicator State		State Description
RUN	 RUN	OFF: Stop
	 RUN	ON: Running
FWD/REV	 FWD/REV	OFF: Forward running
	 FWD/REV	ON: Reverse running
TUNE/TC	 TUNE/TC	OFF: --
	 TUNE/TC	ON: Auto-tuning state
 Hz — RPM — A — % — V		Frequency unit Hz
 Hz — RPM — A — % — V		Current unit A
 Hz — RPM — A — % — V		Voltage unit V
 Hz — RPM — A — % — V		Rotation speed unit RPM
 Hz — RPM — A — % — V		Percentage %

4.2.3 Data Display

There is a five-digit LED display on the operation panel. It displays the set frequency, output frequency, all kinds of monitoring data, and fault codes.

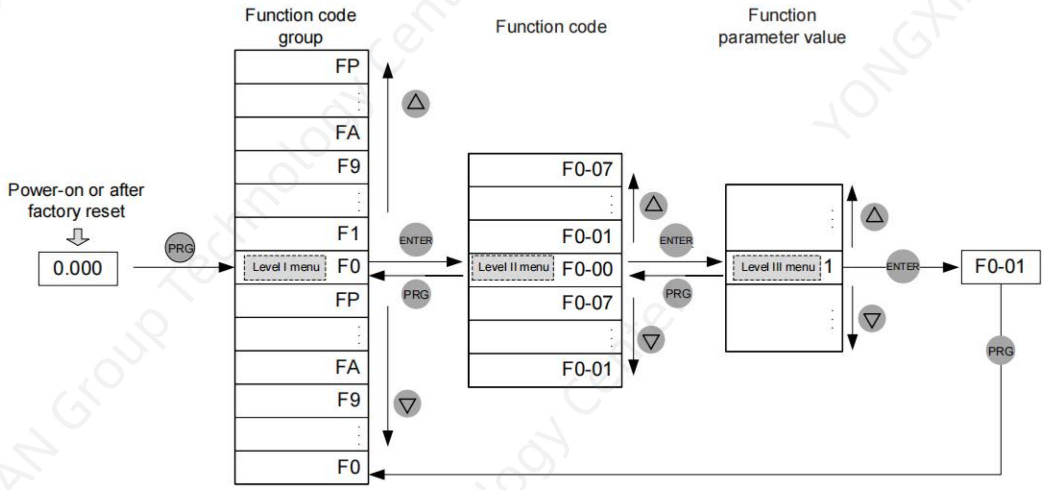
Table 4-2 LED display and actual data

LED Display	Actual Data	LED Display	Actual Data	LED Display	Actual Data	LED Display	Actual Data
0	0	6	6	C	C	n	N
1	1	7	7	c	c	P	P
2	2	8	8	d	D	r	R
3	3	9	9	E	E	T	T
4	4	A	A	F	F	U	U
5	5, S	b	B	L	L	u	u

4.2.4 Basic Operations

The operation panel adopts the following three-level menus.

- Level I: function code group
- Level II: function code
- Level III: function code setting value



1 Parameter display

Specific contents of display parameters are set in FA-01 (Display in running state) and FA-02 (Display in stop state). Every binary bit of FA-01 and FA-02 indicates specific parameter contents (For details, refer to the description of parameters). If a bit is set to 1, the parameter indicated by this bit is displayed; if this bit is set to 0, the parameter is not displayed.

In stop or running state, multiple state parameters can be displayed by pressing ▷ on the operation panel to switch over every byte of FA-01 and FA-02.

■ Running state parameters

16 running state parameters are available in running state. Select whether to display a parameter corresponding to every bit according to binary bits of FA-01 (Display in running state).

■ Stop state parameters

12 stop state parameters are available in stop state. Select whether to display a parameter corresponding to every bit according to binary bits of FA-02 (Display in stop state).

NOTE

◆ For details of states, refer to FA-01 and FA-02 in 6 Parameter Description

2 Parameter viewing

Press PRG and then △ / ▽ to display the level I menu, i.e. the classification of parameter groups.

After entering every level of menu, if a display bit blinks, it indicates that you can perform modification by pressing △ , ▽ , and ▷ . The following figure shows the operation flow.

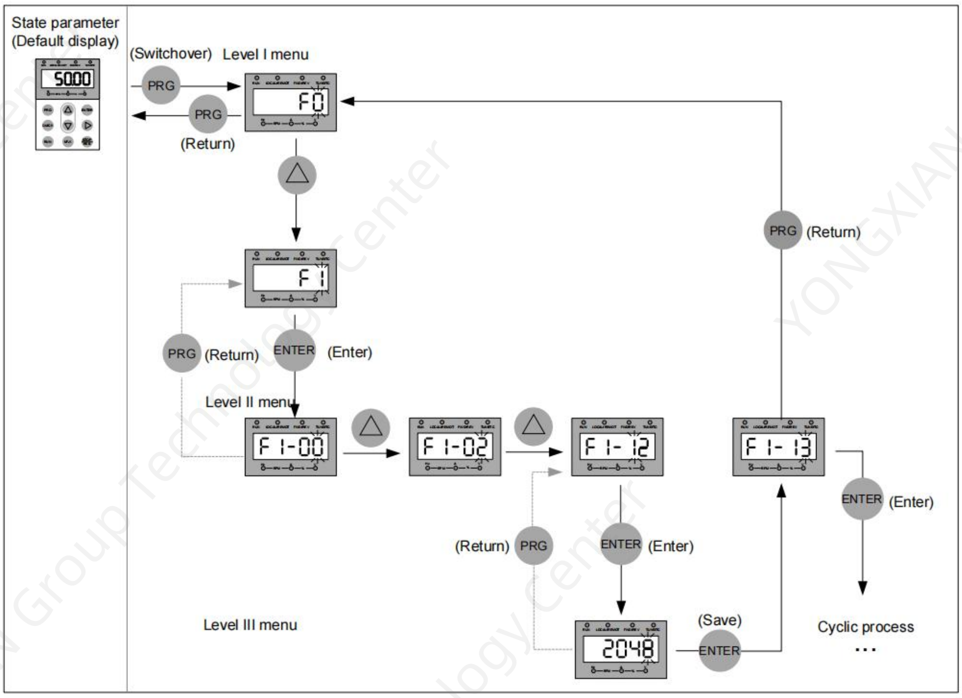


Figure 4-4 Parameter viewing procedure

3 Parameter modification

After entering every level of menu, if a display bit blinks, it indicates that you can perform modification by pressing △ , ▽ , and ▷ .

You can return to Level II menu from Level III menu by pressing PRG or ENTER. The difference between the two is as follows:

- After you press ENTER, the system saves the parameter setting first, and then goes back to Level II menu and shifts to the next parameter.
- After you press PRG, the system gives up the current parameter modification and directly returns to Level II menu and remains at the current function code.

When operating in Level III menus, if the parameter does not include a blinking digit, then it is not allowed to change that parameter. There are two possible reasons for this:

- This parameter is only readable, such as, AC drive type, actually detected parameter and running record parameter.
- It can only be modified after the motor is shut down.

Example Change F3-02 from 10.00 Hz to 15.00 Hz

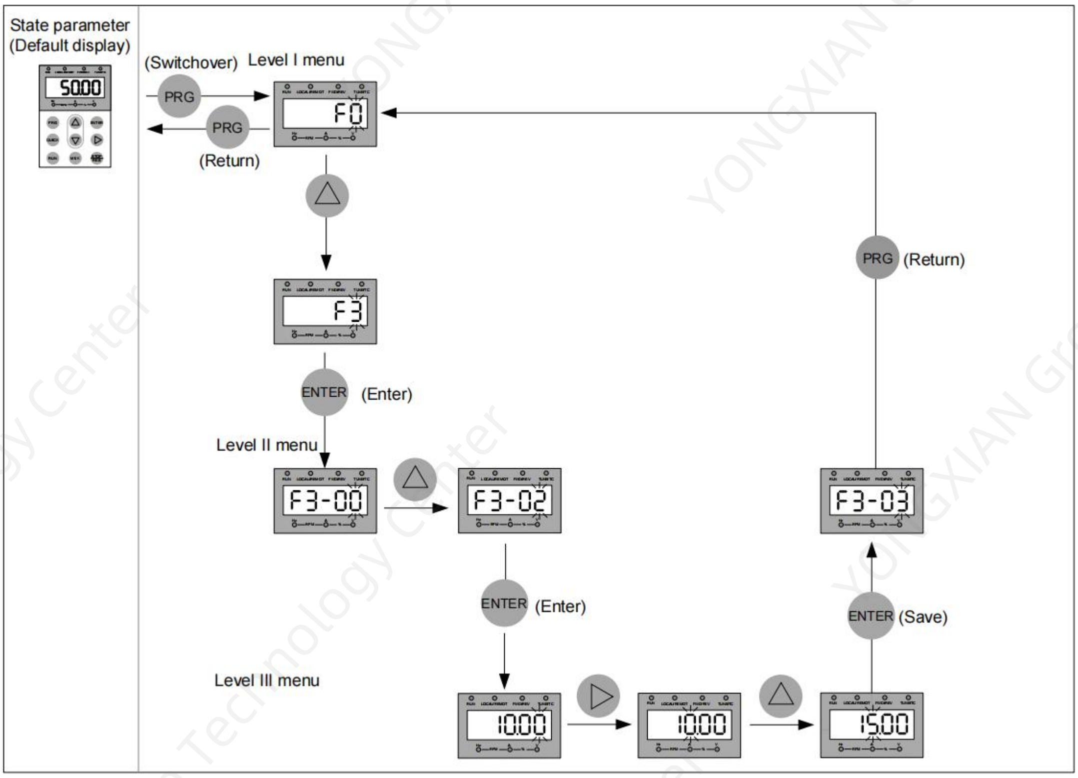


Figure 4-5 Parameter modification procedure

4.3 Cell phone commissioning software

This software mainly implements parameter setting, function commissioning, real-time operating state monitoring, parameter uploading and downloading, and elevator control system firmware burning of the controller using a smartphone.

For details, refer to the User Manual of Elevator Commissioning APP via Smartphone with data code 19010576.

5 System Commissioning

This chapter describes the basic commissioning guide of the NICE3000^{new}. By following the instruction, you can perform complete commissioning on the elevator system and implement all basic normal running functions of the elevator.

5.1 System Commissioning Guide

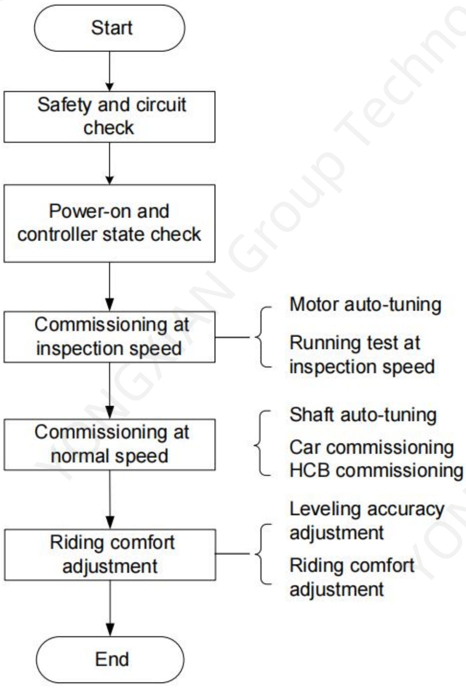


Figure 5-1 Overall commissioning flowchart of the NICE3000^{new}

5.2 Safety and Circuit Check

Pay attentions to the following precautions before performing commissioning:
⚠ Caution ◆ The input and output terminals of the NICE3000^{new} have default setting at delivery. You can change the setting based on your requirements. The examples in this manual are all based on the default setting of the terminals.

1 System Wiring Diagram

Refer to Figure 2-39.

2 Safety Check Flowchart

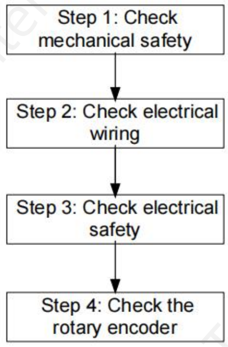


Figure 5-2 Flowchart of safety and circuit check before power-on

Step 1: Check mechanical safety.

Check that the shaft is unobstructed, there is no person in the shaft, inside or on top of the car, and the conditions for elevator safe running are met.

Step 2: Check electrical wiring.

□√	No.	Inspection Points
□	1	The power supply R, S, T cables are wired correctly and securely.
□	2	The UVW cables between the controller and the motor are wired correctly and securely.
□	3	The controller (cabinet) and motor are grounded correctly.
□	4	The safety circuit is conducted, and the emergency stop buttons and switches in the cabinet and in the equipment room can be enabled.
□	5	The door lock circuit is conducted. The door lock circuit is disconnected when the car door or any hall door opens.

Safety Information
⚠ Danger To guarantee safe running of elevator ◆ Short the safety circuit with caution. If the elevator starts running when the safety circuit is shorted, it will cause serious personal injury or even death. ◆ Before starting commissioning, ensure that there is no person in the shaft; otherwise, it will cause personal injury or even death. ◆ NEVER perform commissioning at normal speed when the safety circuit is shorted. ◆ NEVER short the door lock circuit during elevator startup and running. Failure to comply will result in serious personal injury or even death.

Step 3: Check electrical safety.

□√	No.	Inspection Points
□	1	The line voltage of the user power supply is within 380–440 V, and the phase unbalance degree does not exceed 3%.
□	2	The total lead-in wire gauge and total switch capacity meet the requirements.
□	3	There is no inter-phase or to-ground short circuit in the R, S, T power supply.
□	4	There is no inter-phase or to-ground short circuit in the U, V, W phases of the controller. There is no to-ground short circuit in the U, V, W phases of the motor.
□	5	There is no to-ground short circuit on the output side of the transformer.
□	6	There is no inter-phase or to-ground short circuit in the 220 V power supply.
□	7	The 24 V power supply has no short circuit between positive and negative or to-ground short circuit.
□	8	The CANbus/Modbus communication cable has no short circuit with the 24 V power supply or short circuit to ground.

Step 4: Check the rotary encoder.

□√	No.	Inspection Points
□	1	The encoder is installed reliably with correct wiring.
□	2	The encoder signal cables and strong-current circuit are laid in different ducts to prevent interference.
□	3	The encoder cables are preferably directly connected to the control cabinet. If the cable is not long enough and an extension cable is required, the extension cable must be a shielded cable and preferably welded to the original encoder cables by using the soldering iron.
□	4	The shield of the encoder cables is grounded on the end connected to the controller (only one end is grounded to prevent interference).

5.3 Power-on and Controller State Check

5.3.1 Checking Power-on State

□√	No.	Check Contents
□	1	Apply the power. Check that the line voltage of the R, S, T phases of the controller is within 380–440 VAC, with the phase unbalance degree ≤ 3%. If it is abnormal, cut off the power, and check the power supply and the wiring of R, S, T cables on the controller.
□	2	Check that the power input voltage of the 24 V terminal (CN3) on the MCB is 24 VDC±15%. If it is abnormal, cut off the power; check the switch-mode power supply and check whether the 24 VDC circuit is wired correctly.

5.3.2 State Check at Normal Power-on

□√	No.	Check Contents
□	1	Check that the keypad has display after power-on. If there is no display on the keypad, check whether the power supply of the controller is normal.
□	2	If the input signal indicators shown in the preceding figure become ON, it indicates that the 24 VDC power supply is normal, and the X input terminals work properly. If none of the indicators is ON, it indicates that the 24 VDC power supply is abnormal, and you need to eliminate the problem.

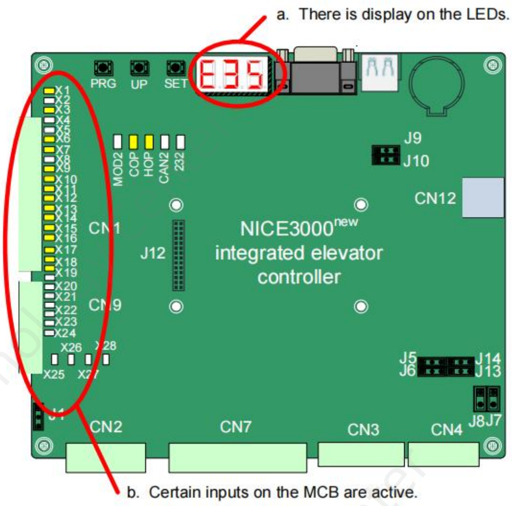


Figure 5-3 MCB display after normal power-on

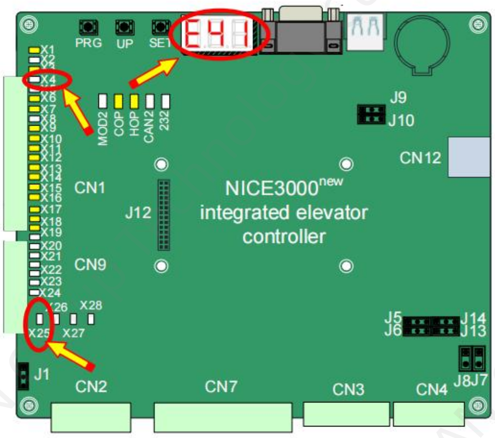
5.3.3 Potential Controller States and Handling Methods Before Commissioning

1 Check the controller state and handle related faults accordingly as follows:

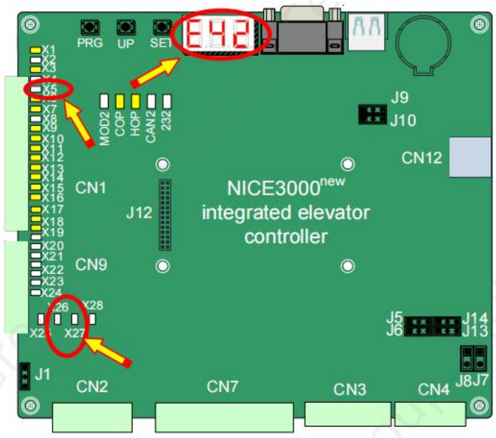
During commissioning especially at first-time power-on, certain faults may occur because the conditions for automatic elevator running are not met and certain peripheral signals are not connected. Such faults include E41, E42, E35, E51, E52, and E58. The following part describes the MCB state at fault and handling of these faults.

MCB state at occurrence of E41, E42, E35, E51, E52, and E58

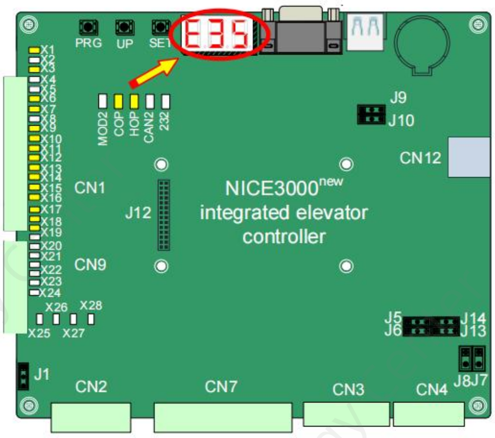
MCB state at fault E41



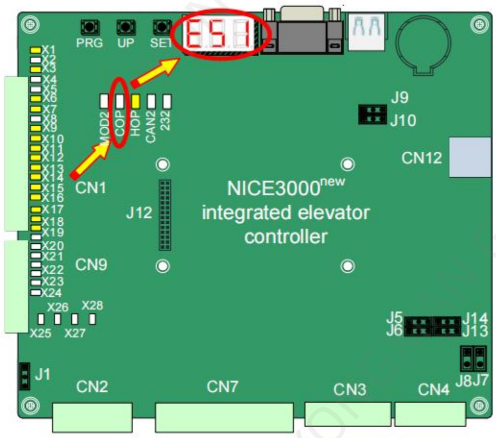
MCB state at fault E42



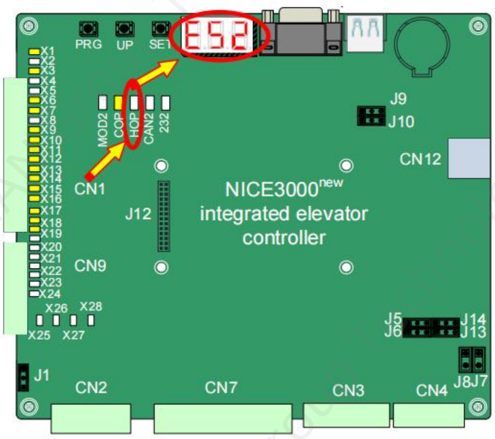
MCB state at fault E35



MCB state at fault E51



MCB state at fault E52



MCB state at fault E58

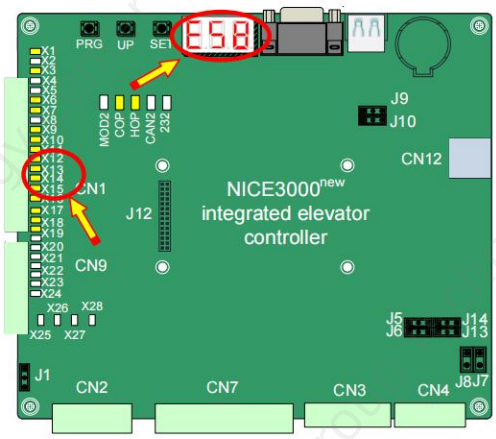


Figure 5-4 MCB state at faults during commissioning

2 Handling of faults E41, E42, E35, E51, E52, and E58 before commissioning at inspection speed

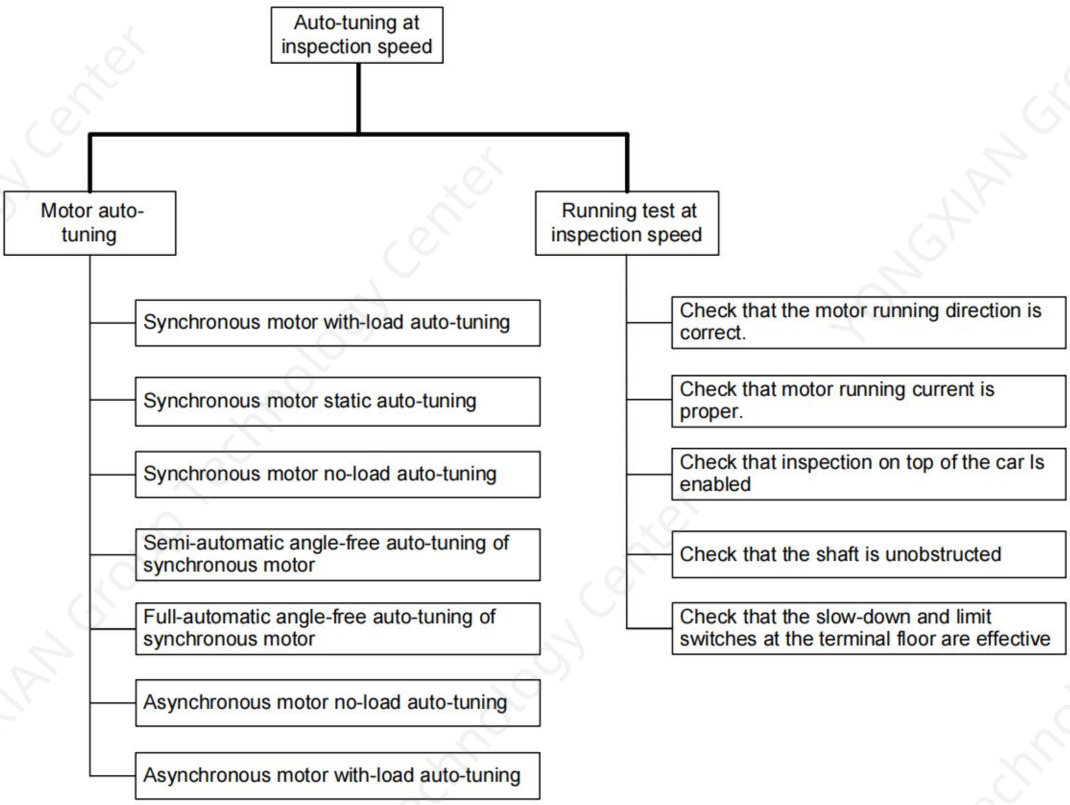
Table 5-1 Fault handling before commissioning at inspection speed

<table>
<tr><th>fault</th><th>Fault Name</th><th>Fault Description</th><th>Handling Method</th></tr>
<tr><td>E41</td><td>Safety circuit fault</td><td>1. At this fault, the elevator cannot run or be commissioned.
2. By default, the safety circuit input signal is connected to terminals X4 and X25.</td><td>Observe whether the signal indicator of input terminals X4 and X25 is ON. If this indicator is OFF, the safety circuit is disconnected. In this case, you need to repair the safety circuit. Then, you can perform commissioning at inspection speed.</td></tr>
<tr><td>E42</td><td>Door lock circuit fault</td><td>1. At this fault, the elevator cannot run or be commissioned.
2. By default, the door lock circuit signal is connected to terminals X5, X26, and X27.</td><td>Observe whether the signal indicator of terminals X5, X26, and X27 is ON. If this indicator is OFF, the door lock circuit is disconnected. In this case, you need to repair the door lock circuit. Then, you can perform commissioning at inspection speed.
NEVER short the door lock circuit for commissioning.</td></tr>
<tr><td>E35</td><td>Shaft auto-tuning data abnormal</td><td>This fault is reported at each power-on because shaft auto-tuning is not performed. It does not affect commissioning at inspection speed.</td><td rowspan="3">Press MF.K on the operation panel to hide the fault display.
Then, you can perform commissioning at inspection speed.</td></tr>
<tr><td>E51</td><td>CAN communication fault</td><td>1. This fault does not affect commissioning at inspection speed, and it affects only commissioning at normal speed.
2. The COP indicator is OFF at this fault.</td></tr>
<tr><td>E52</td><td>HCB communication abnormal</td><td>1. This fault does not affect motor auto-tuning and commissioning at inspection speed.
2. The HOP indicator is OFF at this fault.</td></tr>
<tr><td>E58</td><td>Shaft position switches abnormal</td><td>1. The elevator cannot run. You need to rectify the fault first and then perform commissioning at inspection speed.
2. The fault cause may be: The feedback inputs of both up and down slow-down switches 1 are active; feedback inputs of both up and down limit switches are active simultaneously.</td><td>1. Terminals X14 and X15 are connected to the slow-down switches 1 (NC input). Observe whether the signal indicators of both X14 and X15 are OFF. Check whether the slow-down switches 1 are connected to X14 and X15 and act properly.
2. Terminals X12 and X13 are connected to the up and down limit switches (NC input). Observe whether the signal indicators of both X12 and X13 are OFF. Check whether the limit switches are connected to X12 and X13 and act properly.</td></tr>
</table>

5.4 Commissioning at Inspection Speed

Safety Information
Caution ◆ Ensure that all installation and wiring comply with the electrical safety specifications before commissioning at inspection speed. ◆ During auto-tuning involving the car, pay attention to the running direction of the motor and prevent the elevator from getting too close to the terminal floor. You are advised to run the car to the floor far away (for example, more than 2 floors away) from the terminal floor, and then perform commissioning. ◆ For certain cabinets, "emergency electric RUN" is used instead of "inspection RUN". Note that "emergency electric RUN" shorts certain safety circuit in the shaft, and you need to pay more attentions to the safety when the car runs close to the terminal floor.
Danger To guarantee safe running of elevator ◆ The motor may rotate during auto-tuning. Keep a safety distance from the motor to prevent personal injury. ◆ During with-load motor auto-tuning, ensure that there is no person in the shaft to prevent personal injury or death.

Commissioning at inspection speed includes motor auto-tuning and running test at inspection speed.



5.4.1 Motor Auto-tuning

1 Parameters related to motor auto-tuning

Parameters	Parameter Description	Description
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor
F1-00	Encoder type	0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: Endat absolute encoder
F1-12	Encoder pulses per revolution	0 to 10000
F1-01 to F1-05	Rated motor power Rated motor voltage Rated motor current Rated motor frequency Rated motor rotational speed	These parameters are model dependent, and you need to manually input them according to the nameplate.
F0-01	Command source selection	0: Operation panel control 1: Distance control
F1-11	Auto-tuning mode	0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning 1 4: Shaft auto-tuning 2 5: Synchronous motor static auto-tuning
F1-22	Auto-tuning function selection	F1-22 = 2: Semi-automatic angle-free auto-tuning Angle auto-tuning is performed in the first inspection or emergency electric RUN after power-off and power-on again. F1-22 = 6: Full-automatic angle-free auto-tuning Angle auto-tuning is performed in the first running after power-off and power-on again (without differentiating elevator states).

2 Motor auto-tuning flowcharts

1) Synchronous motor auto-tuning

Synchronous motor with-load auto-tuning (motor connected with car)

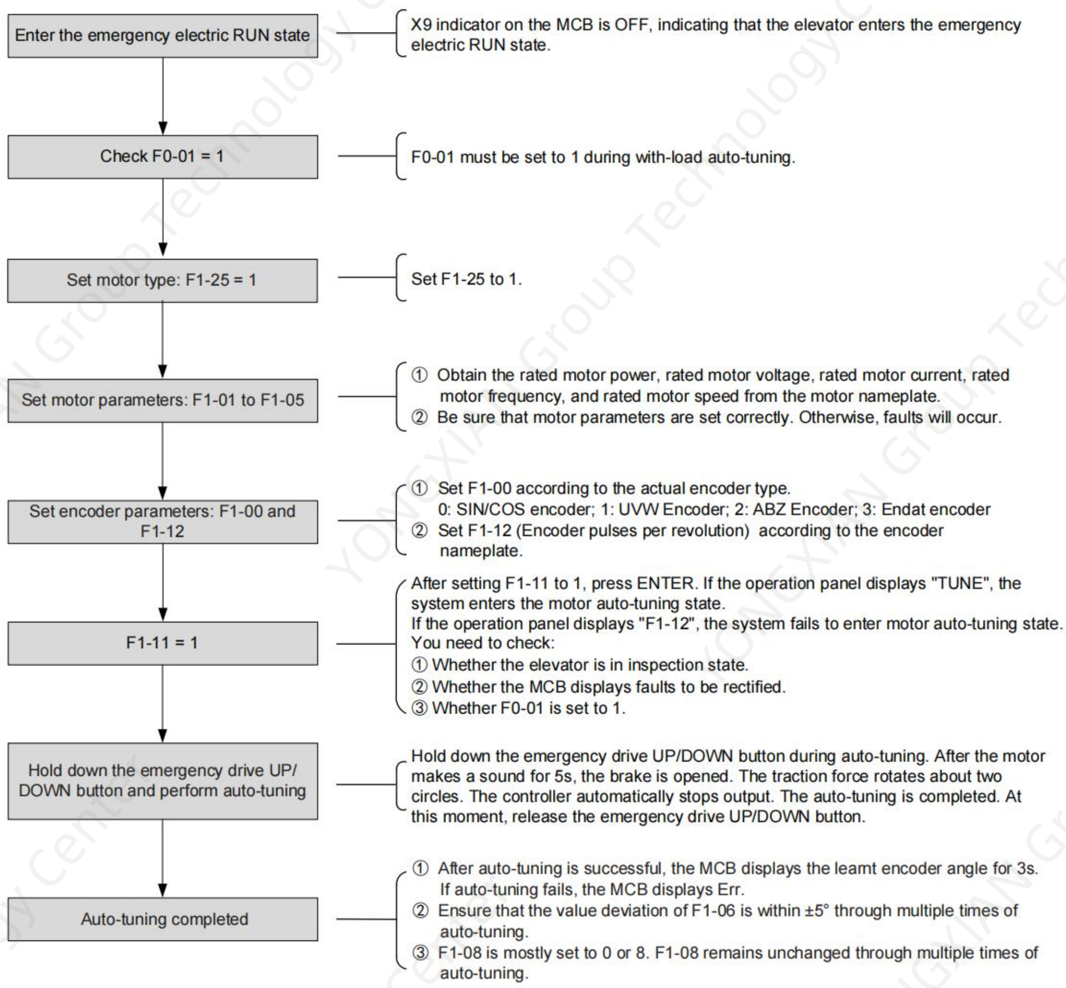


Figure 5-5 Synchronous motor with-load auto-tuning

Synchronous motor static auto-tuning (motor connected with car, brake not released and motor not rotate)

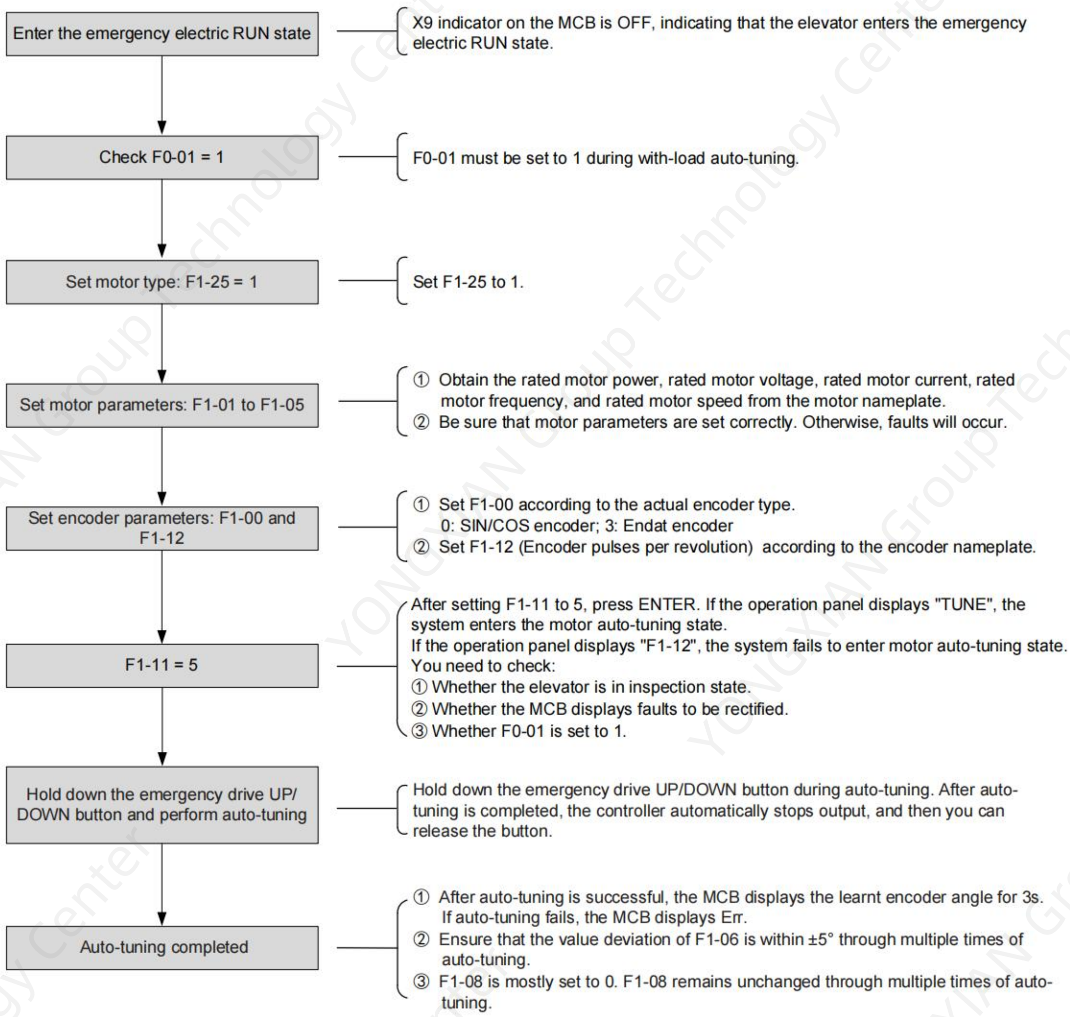


Figure 5-6 Synchronous motor static auto-tuning

NOTE

- Static auto-tuning is available only for the SIN/COS encoder and absolute encoder of the synchronous motor. The output power cable sequence of the controller must be consistent with the encoder cable sequence.
- During auto-tuning, F1-08 must be set to 0. If the actual encoder phase sequence is 8, set F1-24 BIT6 to 1 and F1-08 to 0.

Semi-automatic angle-free auto-tuning of synchronous motor

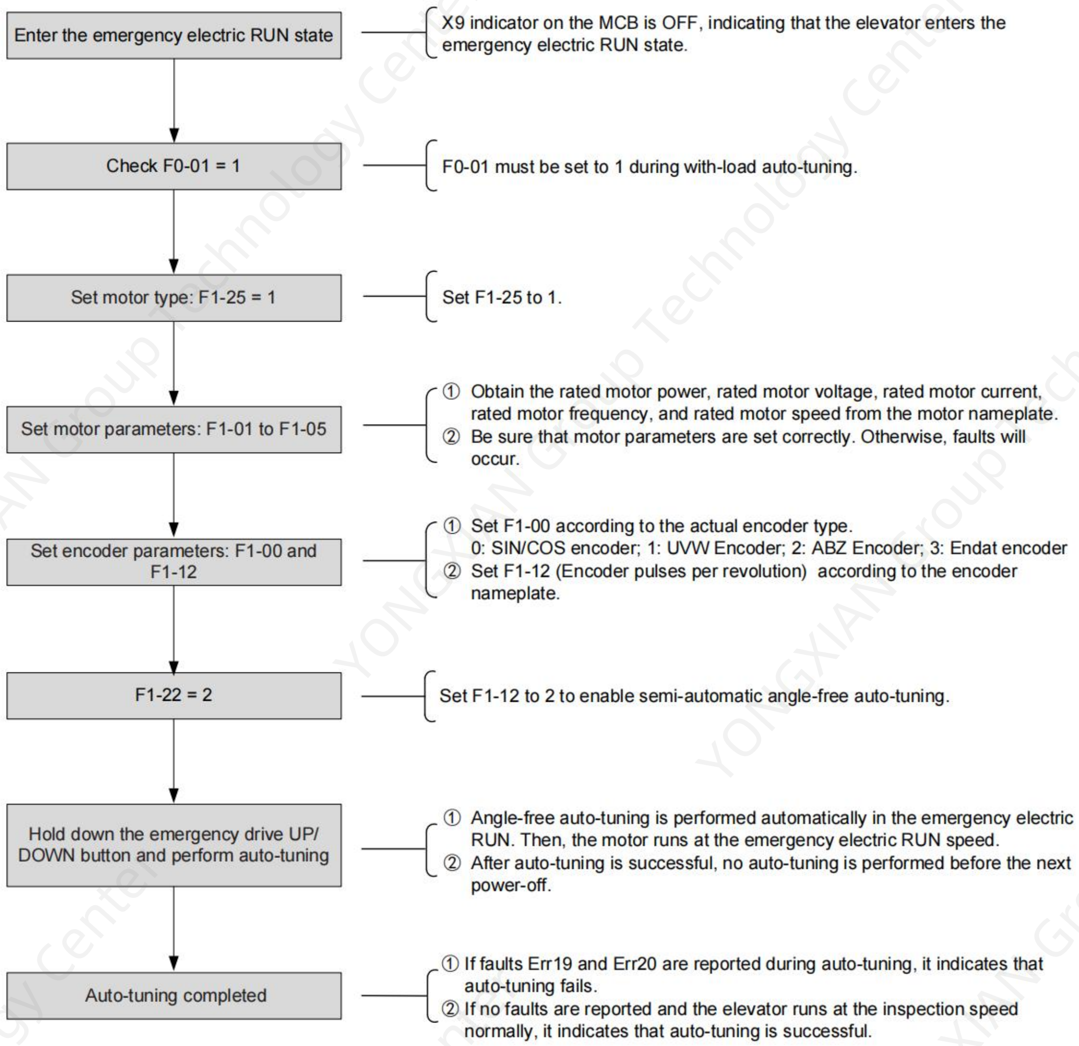


Figure 5-7 Semi-automatic angle-free auto-tuning of synchronous motor

Automatic angle-free auto-tuning

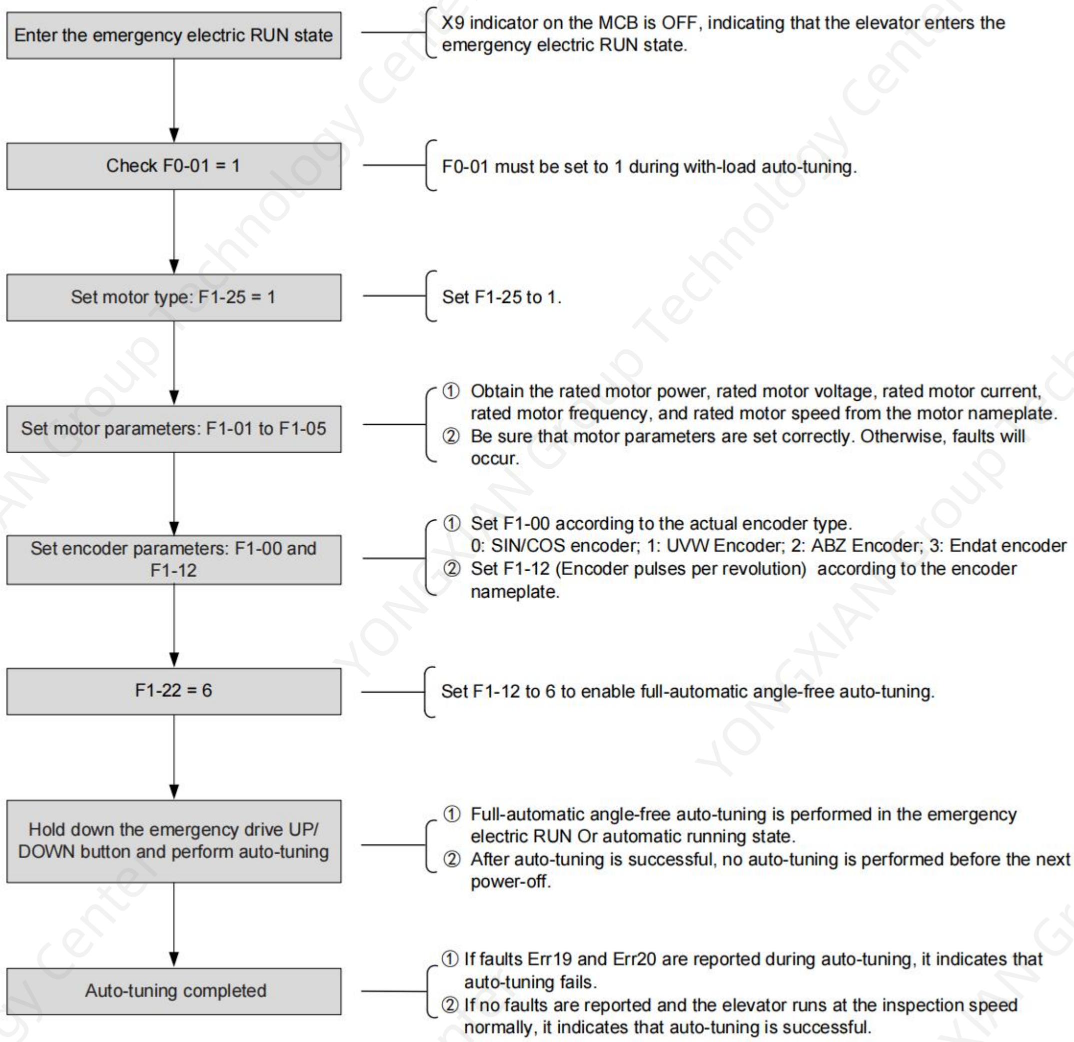


Figure 5-8 Full-automatic angle-free auto-tuning of synchronous motor

Synchronous motor no-load auto-tuning (motor disconnected from car)

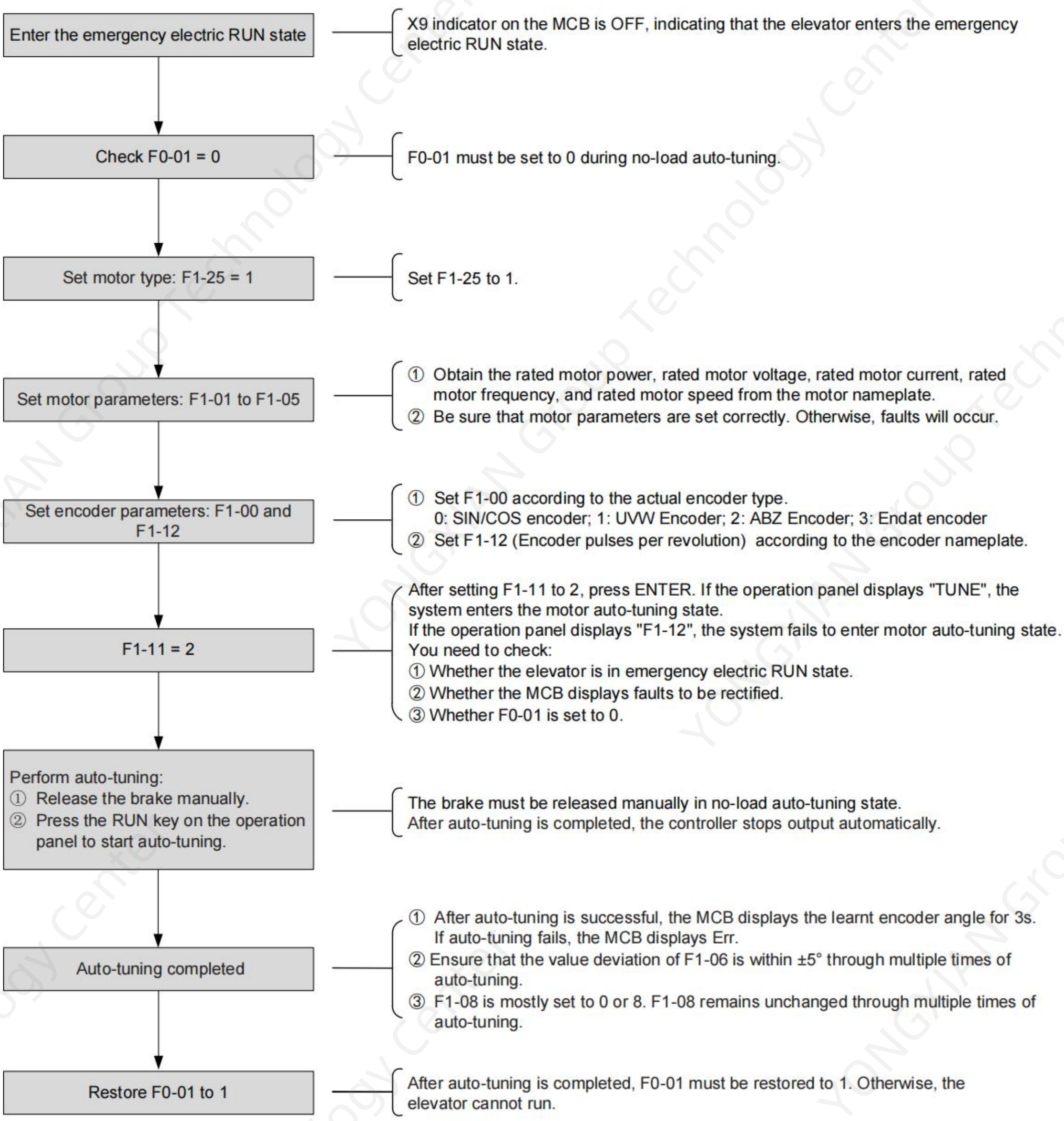


Figure 5-9 Synchronous motor no-load auto-tuning

Pay attention to the following precautions during synchronous motor auto-tuning:

- Synchronous motor auto-tuning learns motor initial pole angle, encoder initial angle, motor wiring mode, and shaft-D and shaft-Q inductance.
- Perform three or more times of auto-tuning; compare the obtained values of F1-06 (Encoder initial angle), and the value deviation of F1-06 shall be within ±5° .
- Each time the encoder, encoder cable connection or motor wiring sequence as well as rated motor current, frequency and speed is changed, perform motor auto-tuning again.
- You can modify F1-06 manually. The modification takes effect immediately. Therefore, when you replace the MCB, you can directly run the controller by manually setting F1-06 to the original value rather than performing motor auto-tuning..

2) Asynchronous motor auto-tuning

a) Asynchronous motor with-load auto-tuning (motor connected with car)

Figure 5-10 Asynchronous motor with-load auto-tuning

b) Asynchronous motor no-load auto-tuning

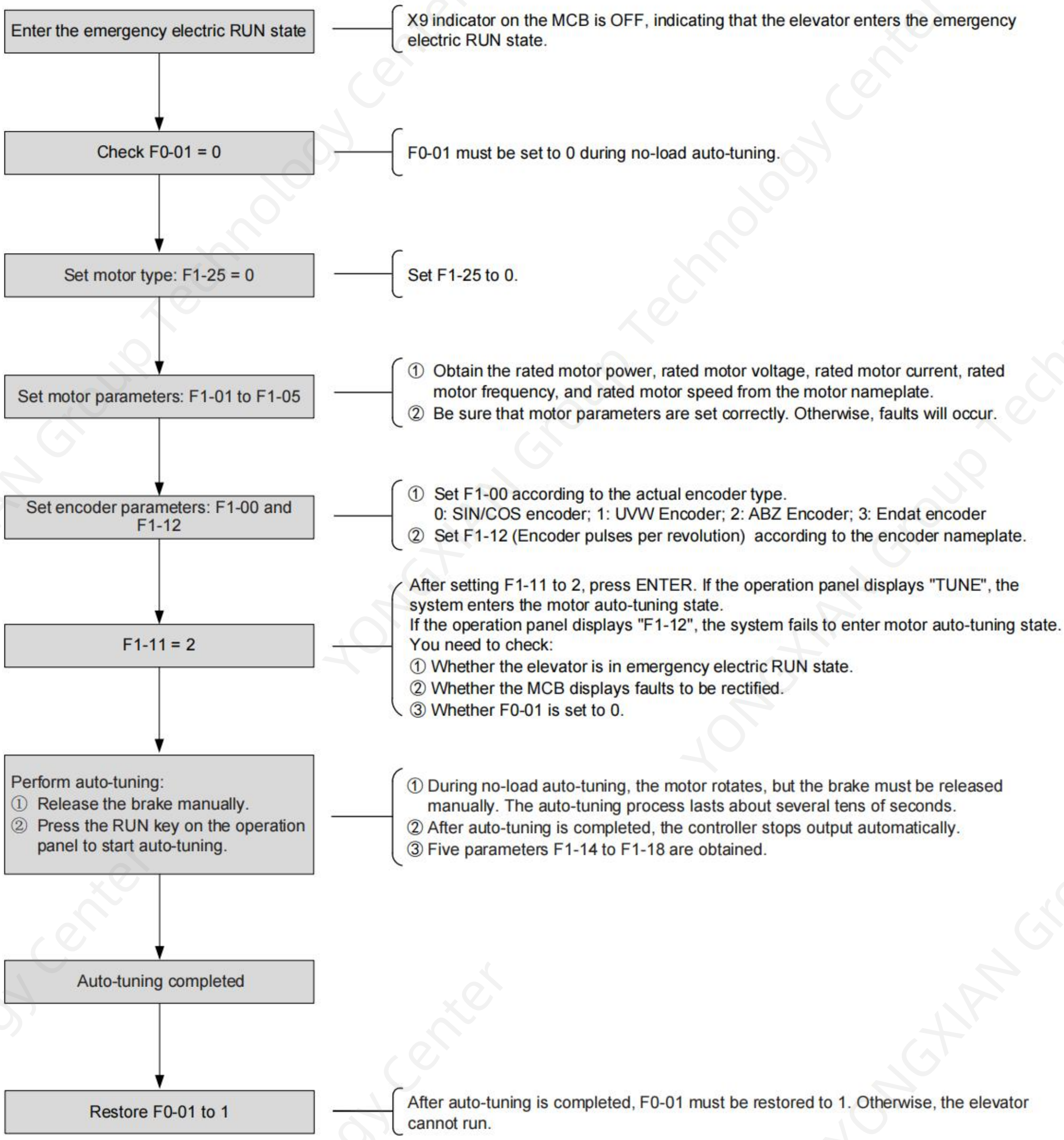


Figure 5-11 Asynchronous motor no-load auto-tuning

Pay attention to the following precautions during asynchronous motor auto-tuning:

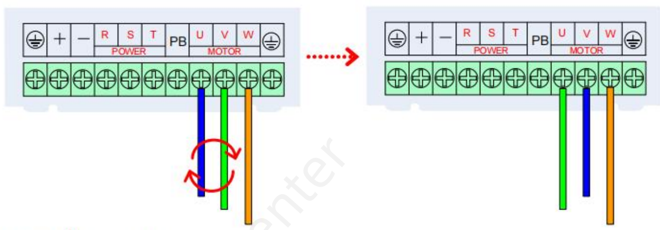
- The sequence of encoder phases A and B must be correct. If the sequence is incorrect, fault Err38 is reported. To solve the problem, exchange phases A and B of the encoder.

The system handles the output commands to the RUN contactor or brake contactor differently in different motor auto-tuning modes, as described in the following table.

Table 5-2 Output state of RUN and brake contactors and motor state

Auto-tuning Mode / Working Mode / Controlled Object	No-load Auto-tuning		With-load Auto-tuning		
	Synchronous Motor	Asynchronous Motor	Synchronous Motor	Synchronous Motor Static Auto-tuning	Asynchronous Motor
RUN contactor	Working	Working	Working	Working	Working
Brake contactor	Not working	Not working	Working	Not working	Not working
Motor	Rotate	Rotate	Rotate	Not rotate	Not rotate

Possible faults and handling

<table>
<tr><th>Auto-tuning Fault</th><th>Fault Symptom</th><th>Handling Method</th></tr>
<tr><td rowspan="2">Auto-tuning fails.</td><td>Fault E19 is reported.</td><td>Check whether the encoder cable is broken; replace a new PG card and perform auto-tuning again.
Check whether the encoder cables are broken; replace a new PG card and perform auto-tuning again.</td></tr>
<tr><td>Auto-tuning fails, and fault Err20 is reported.</td><td>a.Check whether the encoder cables and strong current circuit are in separate troughs.
b.Check whether the brake is released completely. If not, check whether power supply of the brake and power circuit are normal.
c.Check whether the encoder cables are broken.
d.Check whether there is interference on the encoder cables by observing whether the encoder cables are too close to the motor power cables.
e.Check whether the encoder is in good condition and installed securely.
f.The low-power motor (such as P ⩽ 5.5 kW) may jitter after auto-tuning starts. Decrease the value of F2-00 to within 10–40.</td></tr>
<tr><td>The motor wiring sequence is incorrect.</td><td>Err20 and Err33 may be reported.</td><td>Exchange the motor cables. Then, perform auto-tuning again. The following figure shows the exchange of the motor cables:


Note: Fault symptoms
1. During no-load auto-tuning, if the motor wiring sequence is incorrect,
Err20 (E0-00) with fault subcode 3 (E0-01) will be reported.
2. During with-load auto-tuning, if the motor wiring sequence is incorrect,
the synchronous motor will jitter abnormally during auto-tuning, Err33 is reported, and auto-tuning stops.
For the asynchronous motor, there is no prompt during auto-tuning, but Err33 is reported during running at inspection speed.</td></tr>
</table>

NOTE	
	◆ When the above two problems occur, the wiring sequence from the motor to the controller needs to be changed. ◆ To change the wiring sequence: swap any two wires on adjacent phases, for only once.

5.4.2 Running Test at Inspection Speed

Parameters	Parameter Description	Description	Default
F2-10	Elevator running direction	0: Direction unchanged 1: Direction reversed	0
F3-25	Emergency electric RUN speed	0.100–0.600 m/s	0.250 m/s

■ Running Test Flow at Inspection Speed

1. Check that the motor running direction is correct.

- After auto-tuning is completed successfully, perform trial running at inspection speed to check Whether the actual motor direction is the same as the command direction. If not, change F2-10 to correct the direction.

2. Check that the motor running current is normal.

- During running at inspection speed, the current for motor no-load running is smaller than 1 A, and the actual current during with-load constant-speed running is not larger than the rated motor current. If after multiple times of auto-tuning, the encoder angle deviation is small but the current during with-load constant-speed running is larger than the rated motor current, check:

☐ Whether the brake is released completely
☐ Whether the elevator balance coefficient is normal
☐ Whether the car or counterweight guide shoes are too tense

3. Check that inspection on top of the car is enabled.

- Check that car top inspection is enabled and inspection in equipment room is disabled. That is, inspection on top of the car takes precedence over inspection in the equipment room.

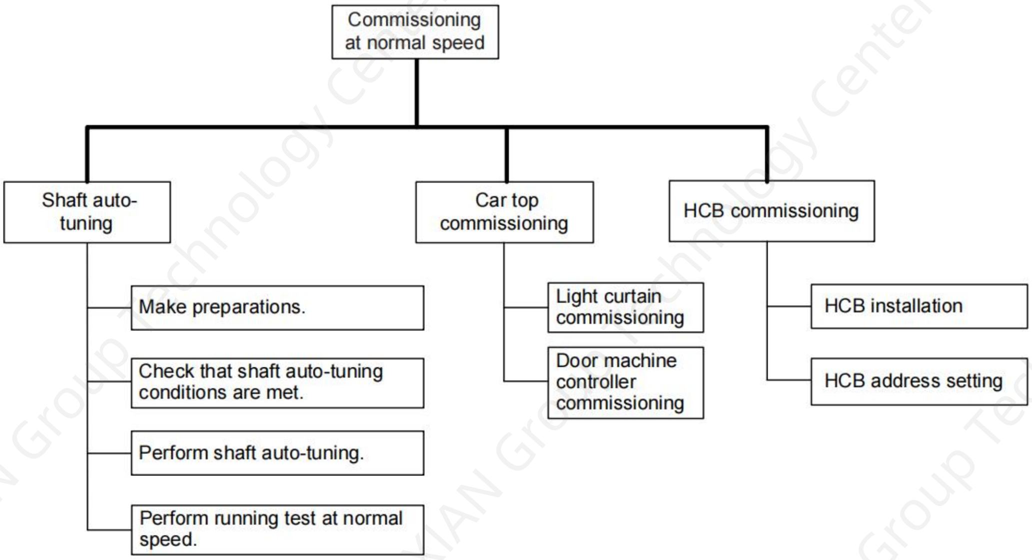
4. Check that the shaft is unobstructed.

- Check that the shaft is unobstructed without any obstacles, so that the car will not be damaged.

5. Check that the slow-down switches and limit switches are effective.

- Check that the slow-down switches and limit switches are effective and pay special attention To safety when you run the car to the terminal floor. It is recommended that the running time and distance be not long each time, preventing over travel terminal or damage to the car.

5.5 Commissioning at Normal Speed



5.5.1 Shaft Auto-tuning

1 Make preparations for shaft auto-tuning.

1. Check that the shaft switches act properly.

- Including final limit switches, limit switches, slowdown switches, and leveling switches.

2. Check that the acting sequence of the leveling switches is correct.

- Generally, one leveling switch is installed. If multiple leveling switches are installed, check that the acting sequence is correct. Take the situation with three sensors as an example:
- switch

① Acting sequence of sensors at inspection up: up leveling switch → door zone switch → down leveling switch
② Acting sequence of sensors at inspection down: down leveling switch → door zone switch → up leveling switch

3. Check CANbus communication state.

- Check CANbus communication state. If fault E51 is not reported and the CAN1 indicator on the MCB is steady ON, it indicates that CANbus communication between the MCB and the CTB is normal. If CANbus communication is abnormal, rectify fault E51 according to the solution described in section 7.4.

Parameters

Parameters	Parameter Description	Description	Default	Remarks
F0-04	Rated elevator speed	0.250–8.000 m/s	1.600 m/s	-
F6-00	Top floor of the elevator	F6-01 to F6-56	9	Actual number of floors + 1 - Bottom floor
F6-01	Bottom floor of the elevator	1 to F6-00	1	-
F3-26	Shaft auto-tuning speed	0.250 to 0.630	0.250	-

NOTE

◆ After F0-04 is changed, shaft auto-tuning must be performed again. Otherwise, an abnormality will occur during elevator running.

2 Check that the conditions for shaft auto-tuning have been met.

- The elevator is in emergency drive state.
- The elevator needs to run to below the bottom leveling position, that is, at least one leveling switch is below the leveling plate. The down slow-down switch 1 signal input to the MCB is active. (This condition applies to only the two-floor case.)
- The NICE3000^{new} is not in the fault state. If there is a fault, press STOP/RES to reset the fault.

3 Perform shaft auto-tuning.

When the preceding conditions are met, start shaft auto-tuning by using any of the following methods:

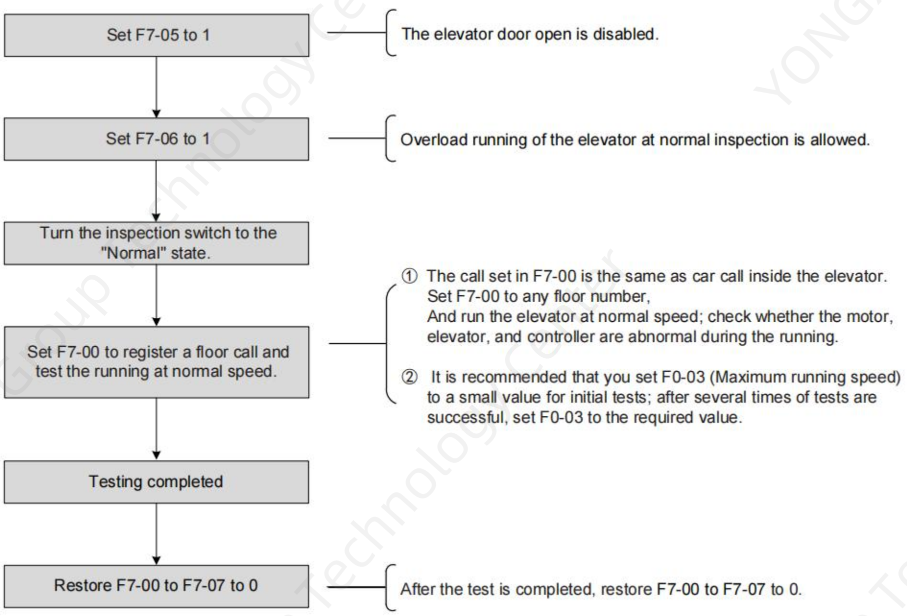
- Set F1-11 to 3 on the operation panel. Switch emergency drive to normal.
- Set F7 to 1 on the keypad of the MCB. Switch emergency drive to normal.

After shaft auto-tuning starts, the elevator runs at the speed set in F3-26. The elevator automatically runs to the leveling plate of the bottom floor and then up to the leveling plate of the top floor and stops after reaching the leveling plate of the top floor. Then, the keypad on the MCB displays the present floor number (top floor), indicating that shaft auto-tuning is successful.

If fault Err35 is reported during the process, it indicates that shaft auto-tuning fails. You need to rectify the fault according to the solution described in Chapter 7, and perform shaft auto-tuning again.

4 Perform running test at normal speed

After shaft auto-tuning is completed successfully, running at normal speed may not be successful because the door controller and full-load/overload function are not commissioned. You can set parameters to enable the system to forbid door open and allow overload, and then perform running test at normal speed.



NOTE

◆ The controller restores F7-00 to F7-02 and F7-05 to F7-07 to 0 after power-on again. If you need to continue the test, set these parameters again.

5.5.2 Car Top Commissioning

Safety Information
Caution
◆ During car top commissioning, the operator stands on top of the car; to guarantee personal safety, ensure that car top inspection is enabled (inspection on top of the car takes precedence over inspection in the equipment room).
◆ The MCTC-CTB is high level active by default.

This section takes the single-door (door 1) elevator system as an example to describe the commissioning. The related signals include light curtain 1, door 1 open/close limit signal, and door 1 open/close output signal, described in the following table.

Table 5-3 Car top commissioning-related signals

CTB Terminal	Terminal Definition
P24	Common for X1 to X8 inputs
X1	Light curtain 1 input
X3	Door 1 open limit input
X5	Door 1 close limit input
BM	Door 1 output common
B1	Door 1 open output
B2	Door 1 close output

For the double-door elevator system, the terminals controlling door 2 signals, such as light curtain 2 signals and door 2 open/close limit signals, have the same principle and monitoring mode as those of door 1. The details are not described here.

The system can monitor the input and output state of the light curtain and door machine signals and whether these signals are active.

■ You can view the signal indicators on the CTB to know the input/output state.

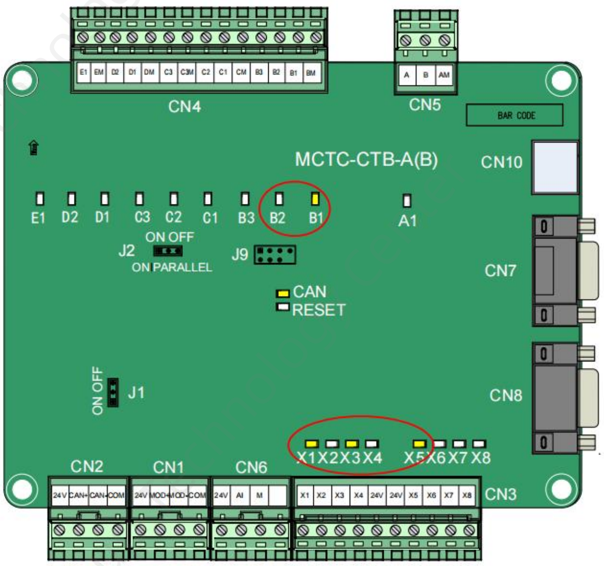


Figure 5-12 Input/output state indicated by CTB signal indicators

Table 5-4 Signal indicator state

Indicator	State Description
X1 to X8 input signal indicator ON	There is high level input to the corresponding input terminals.
B1 to B3 output signal indicator ON	The corresponding output terminal has output.

- You can view F5-35 on the MCB to see whether the light curtain and door machine signals are active.

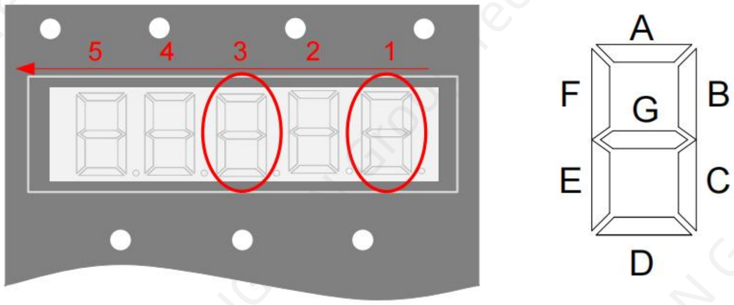


Figure 5-13 F5-35 monitoring method

Table 5-5 F5-35 monitoring description

F-35 LEDs		Indicated Signal (an lit LED segment indicates the corresponding signal I/O is valid)
No.	Segment Mark	
LED 1	A	Door 1 light curtain signal
	C	Door 1 open limit signal
	E	Door 1 close limit signal
LED 3	A	Door 1 open output
	B	Door 1 close output

You need to set the NO/NC features of the CTB input signals in F5-25 and ensure that the setting is consistent with the NO/NC feature of the actual electrical switches (light curtain and door open/close limit switches). CTB control can be implemented only after you perform the setting correctly. If the NO/NC feature setting is inconsistent with the actual conditions, the door cannot open or close properly or fault E53 is reported.

Bit of F5-25	CTB Input Signal
Bit0	Used to set NO/NC feature of door 1 light curtain signal
Bit2	Used to set NO/NC feature of door 1 open limit signal
Bit4	Used to set NO/NC feature of door 1 close limit signal

1 Light Curtain Commissioning

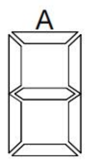
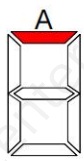
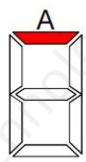
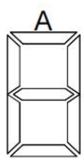
- Check whether the light curtain wiring is correct and secure and whether the power voltage is proper.
- Observe the ON/OFF state of the corresponding signal indicator on the CTB to check whether the light curtain works in normal state. If the state of X1 signal indicator keeps unchanged or changes abnormally, it indicates that the light curtain is abnormal.

Table 5-6 Checking light curtain state based on X1 signal indicator

Signal \ State	Light Curtain Blocking State	State of X1 Signal Indicator
Light curtain signal set to NO	Unblocked	OFF
	Blocked	ON
Light curtain signal set to NC	Unblocked	ON
	Blocked	OFF

- After light curtain commissioning is completed, check whether the setting of F5-25 Bit0 is consistent with the actual NO/NC feature of the light curtain.

Table 5-7 Checking consistency between F5-25 and actual light curtain

Signal \ State	Light Curtain State Monitoring		Signal State Judging	Reset F5-25 Bit0
	Unblocked	Blocked		
Light curtain signal (Segment A of LED1 in F5-35)			Normal	Not required
			Abnormal	Set F5-25 Bit0 to the opposite state: If the original value is 0, change it to 1. If the original value is 1, change it to 0.

2 Door Machine Controller Commissioning

The contact between the door machine controller and the elevator system includes door open and close commands for CTB output as well as door open and close limit signals for door machine controller feedback.

After door machine commissioning and installation is complete, it is necessary to check whether wiring is correct and whether limit signals are consistent with the system defaults. The procedure of door machine controller commissioning is as follows:

- Check that F7-05 (Door open forbidden) is 0 (No).
- Check whether the door machine controller wiring is correct and secure and that the power voltage is proper.

■ Commission the door machine controller, and check that the input and output of the door machine controller are normal in terminal control mode.

Check that the door open/close output is normal:

Short BM/B1 on the CTB, and door 1 opens;

short BM/B2, and door 1 closes.

If the door acts abnormally after you short BM/B1 or BM/B2 on the CTB, check:

Whether cable connection between the CTB and the door machine controller is correct

Whether the function setting of door open/close input terminals is correct

Whether door machine controller commissioning fails. If yes, perform commissioning again.

Check whether the door open/close limit signal feedback from the door machine controller is normal:

Observe the X terminal signal indicators on the CTB and judge whether door open and close limit feedback from the door machine controller is normal according to the following table.

Table 5-8 Judging door open/close limit

Signal \ State	Door State	State of X3 Signal Indicator	State of X5 Signal Indicator
Door open/close limit signal set to NO	At Door Open Limit	Steady ON	Steady OFF
	During door open/close	Steady OFF	Steady OFF
	At Door Close Limit	Steady OFF	Steady ON
Door open/close limit signal set to NC	At Door Open Limit	Steady OFF	Steady ON
	During door open/close	Steady ON	Steady ON
	At Door Close Limit	Steady ON	Steady OFF

If the states of X3 and X5 signal indicators are inconsistent with the actual door state or keeps unchanged, check:

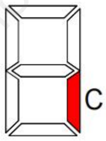
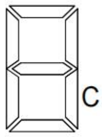
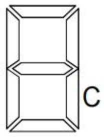
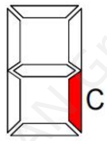
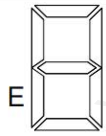
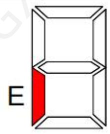
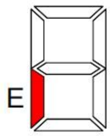
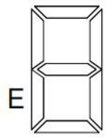
Whether cable connection between the CTB and the door machine controller is correct

Whether the function setting of door open/close output terminals is correct

Whether door machine controller commissioning fails. If yes, perform commissioning again.

■ After door machine controller commissioning is completed, check whether the setting of F5-25 Bit2/Bit4 is consistent with the actual NO/NC feature of door open/close limit signals.

Table 5-9 Checking consistency between F5-25 and actual door open/close limit signals

Signal	Signal State Monitoring		Signal State Judging	Reset F5-25 Bit2/Bit4
	At Door Open Limit	At Door Close Limit		
Door open limit signal (Segment C of LED1 in F5-35)			Normal	Not required
			Abnormal	Set F5-25 Bit2 to the opposite state: If the original value is 0, change it to 1. If the original value is 1, change it to 0.
Door close limit signal (Segment E of LED1 in F5-35)			Normal	Not required
			Abnormal	Set F5-25 Bit4 to the opposite state: If the original value is 0, change it to 1. If the original value is 1, change it to 0.

■ Handling of Common Door Control Problems

■ In the door close state, the system sends a door open command but the door does not open.

Check whether the door open limit signal is always active.

Check whether there is door open output by viewing segment 1 of LED 1 in FA-34. If there is output (segment 1 ON), check: whether cable connection between the CTB and the door machine controller is correct and whether the door machine controller works properly.

■ In the door open limit state, the system sends a door close command but the door does not close.

Check whether the light curtain signal is always active.

Check whether there is door close output by viewing segment 2 of LED 1 in FA-34. If there is output (segment 2 ON), check: whether cable connection between the CTB and the door machine controller is correct and whether the door machine controller works properly.

■ The elevator does not open the door in door zone area and fault Err53 is reported. Rectify the fault according to the solution described in Chapter 7.

5.5.3 HCB Installation and Setting

This section describes HCB installation and setting of the single-door independent elevator system. For details on HCB installation and setting of parallel elevator system and opposite door elevator system, refer to related sections.

1 HCB installation

Install an HCB for each service floor (non-service floors do not require the HCB), as shown in Figure 5-14.

The HCB communicates with the MCB via Modbus. All HCBs are connected in parallel and then connected to the MCB.

2 HCB address setting

Set an address for each HCB. Otherwise, the HCB cannot be used.

The address of each HCB must be unique. HCBs with the same address cannot be used. For details on how to set the address, see the description of the corresponding HCB.

Set the address based on the floor leveling plate No.

From the bottom floor, set the address of the HCB for the floor where the Nth leveling plate is located to N, as shown in the following figure, as shown in Figure 5-14.

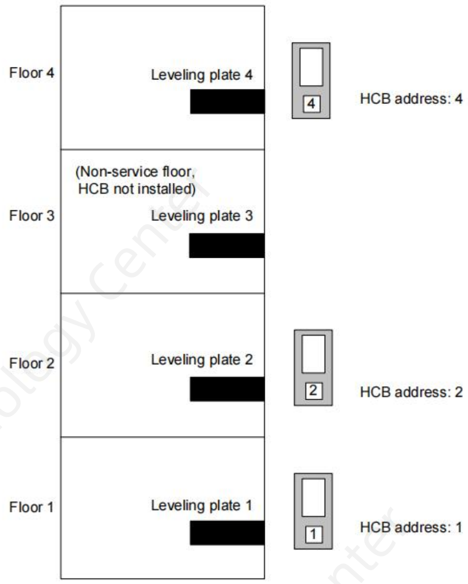


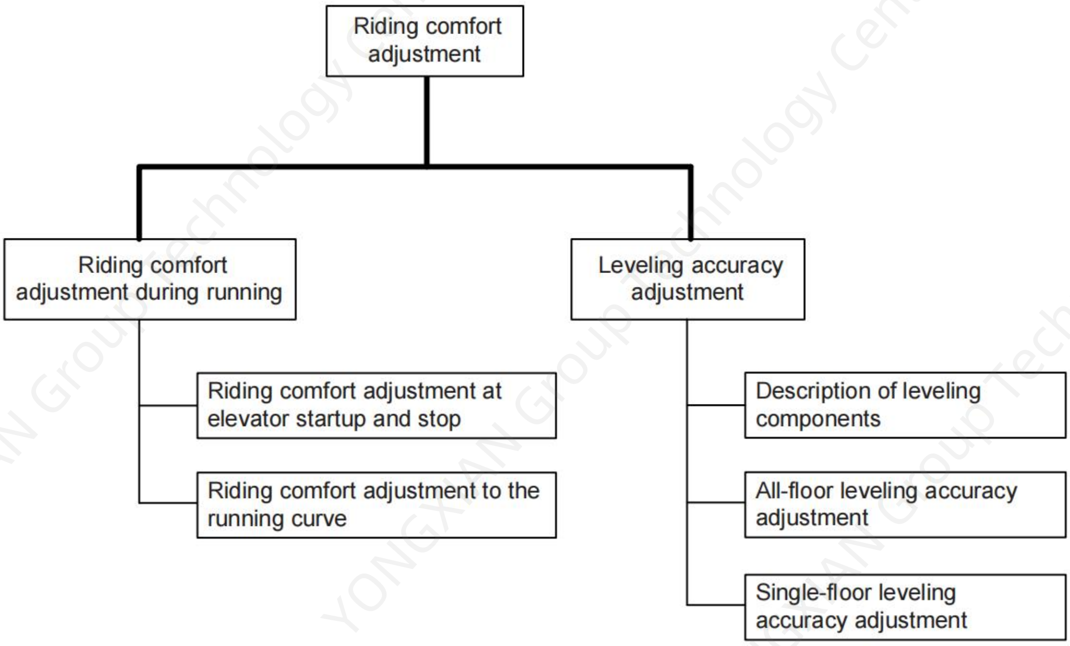
Figure 5-14 HCB installation and address setting

After completing HCB installation and address setting, you can call the elevator by using the HCB to start normal-speed running.

NOTE

◆ When the display board is used inside the car, the address must be set to 0.

5.6 Riding Comfort Adjustment



5.6.1 Riding Comfort Adjustment

The riding comfort is an important factor of the elevator's overall performance. Improper installation of mechanical parts and improper parameter settings will cause discomfort. Enhancing the riding comfort mainly involves adjustment of the controller output and the elevator's mechanical construction.

1 Performance adjustment of system control

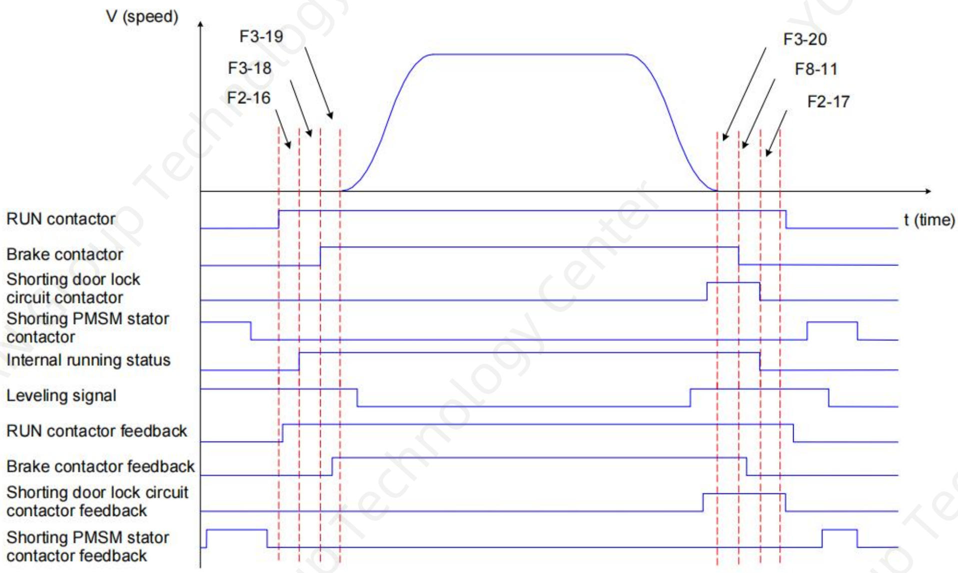


Figure 5-15 Running time sequence

1) Riding comfort adjustment at elevator startup and stop

Related parameters:

Function Code	Parameter Name	Setting Range	Default
F2-00	Speed loop proportional gain 1	0 to 100	40
F2-01	Speed loop integral time 1	0.01 to 10.00s	0.60s
F2-03	Speed loop proportional gain 2	0 to 100	35
F2-04	Speed loop integral time 2	0.01 to 10.00s	0.80s

a) Adjustment to abnormal motor startup

F2-00, F2-01, F2-03 and F2-04 are used to adjust the speed dynamic response characteristics of the motor.

To achieve a faster system response, increase the proportional gain and reduce the integral time. However, too large proportional gain or too small integral time may lead to system oscillation.

Decreasing the proportional gain and increasing the integral time will slow the dynamic response of the motor. However, too small proportional gain or too large integral time may cause motor speed tracking abnormality, resulting in fault E33 or unstable leveling at stop.

The default setting is proper for most large-power motors, and you need not modify these parameters. These parameters need to be adjusted only for small-power motors (P ⩽ 5.5 kW) because they may have oscillation. To eliminate oscillation, do as follows:

Decrease the proportional gain first (between 10 and 40) to ensure that the system does not oscillate,

and then reduce the integral time (between 0.1 and 0.8) to ensure that the system has quick response but small overshoot.

b) Adjustment to elevator startup

■ Adjustment for no-load-cell startup

The parameter setting related to rollback at elevator startup and stop is described in the following table.

Function Code	Name	Setting Range	Default	Description
F8-01	Pre-torque selection	0: Pre-torque invalid 1:Load cell pre-torque compensation 2:Automatic pre-torque compensation 3: Load cell pre-torque and automatic compensation both in effect	2	The no-load-cell startup function is enabled when F8-01 is set to 2. 2: Pre-torque automatic compensation

Function Code	Name	Setting Range	Default	Description
F2-11	Zero servo current coefficient	2.0% to 50.0%	15.0%	These are zero servo adjustment parameters, and are valid only when F8-01 is set to 2 or 3.
F2-12	Zero servo speed loop Kp	0.00 to 2.00	0.50	
F2-13	Zero servo speed loop Ti	0.00 to 2.00	0.60	

Notes:

When no-load-cell pre-torque compensation is used (F8-01 = 2), no analog load cell is required, and the controller quickly compensates the torque based on slight rotation change of the encoder at startup.

The default setting of F2-11 to F2-13 is proper for most large-power motors, and you need not modify these parameters. For the small-power motor (P ⩽ 5.5 kW), the motor may have oscillation or noise at with-load startup, and passengers in the car may have a strong feeling of car lurch. To eliminate oscillation, do as follows:

Decrease the value of F2-11 (between 5 and 15) to eliminate motor oscillation.

Decrease the values of F2-12 and F2-13 (between 0.1 and 0.8) to reduce the motor noise and improve riding comfort at startup.

■ Adjustment for load cell startup

The parameter setting related to rollback at elevator startup and stop is described in the following table.

Function Code	Name	Setting Range	Default	Description
F8-01	Pre-torque selection	0: Pre-torque invalid 1: Weighing pre-torque compensation 2: Pre-torque automatic compensation 3: Weighing pre-torque and automatic compensation both in effect	2	When a load cell is used, set F8-01 to 1. 1: Weighing pre-torque compensation
F8-02	Pre-torque offset	0.0% to 100.0%	50.0%	These are pre-torque regulating parameters.
F8-03	Drive gain	0.00 to 2.00	0.60	
F8-04	Brake gain	0.00 to 2.00	0.60	

Notes:

When an analog load cell is used (F8-01 = 1 in this case), the controller identifies the braking or driving state according to the load cell signal and automatically calculates the required torque compensation value. F8-03 and F8-04 are used to adjust elevator startup when the analog load cell is used. The method of adjusting the two parameters are as follows:

In the driving state, increase F8-03 properly if there is rollback at elevator startup, and decrease F8-03 if there is car lurch at elevator startup.

In the braking state, increase F8-04 properly if there is jerk in command direction at elevator startup, and decrease F8-04 if there is car lurch at elevator startup.

More details about these parameters are as follows:

F8-02 (Pre-torque offset) is actually the elevator balance coefficient, namely, the percentage of the car load to the rated load when the car and counterweight are balanced. This parameter must be set correctly. F8-03 (Drive gain) or F8-04 (Brake gain) scales the elevator's present pre-torque coefficient when the motor runs at the drive or brake side. If the gain set is higher, then the calculated value of startup pro-torque compensation is higher.

The motor's driving state and braking state are defined as follows:

Motor driving state: full-load up, no-load down

Motor braking state: full-load down, no-load up

■ Comfort adjustment is enabled when the weighing compensation and automatic compensation are both in effect.

Function Code	Name	Setting Range	Default	Description
F8-01	Pre-torque selection	0: Pre-torque invalid 1: Weighing pre-torque compensation 2: Pre-torque automatic compensation 3: Weighing pre-torque and automatic compensation both in effect	2	When a load cell is used and the inconsistency of startup effects at different loads is caused by improper load cell linearity, set F8-01 to 3. 3: Weighing pre-torque and automatic compensation both in effect
F8-02	Pre-torque offset	0.0% to 100.0%	50.0%	These are pre-torque regulating parameters.
F8-03	Drive gain	0.00 to 2.00	0.60	
F8-04	Brake gain	0.00 to 2.00	0.60	
F2-11	Zero servo current coefficient	2.0% to 50.0%	15.0%	Automatic pre-torque compensation adjustment parameters
F2-12	Zero servo speed loop Kp	0.00 to 2.00	0.50	
F2-13	Zero servo speed loop Ti	0.00 to 2.00	0.60	

Notes:

When F8-01 is set to 3, the controller identifies the braking or driving state according to the load cell signal, automatically calculates the required torque compensation value,

and quickly corrects the torque compensation value according to the slight rotation change of the encoder at the moment of startup.

The adjustment is based on the combination of “startup comfort adjustment without a load cell” and “startup comfort adjustment with a load cell”.

c) Handling of rollback at elevator startup and stop

The parameter setting related to rollback at elevator startup and stop is described in the following table.

Function Code	Name	Setting Range	Default
F3-19	Brake release delay	0.000 to 2.000s	0.600s
F8-11	Brake release delay	0.200 to 1.500s	0.600s

F3-19 (Brake release delay) specifies the time from the moment when the system sends the brake release command to the moment when the brake is completely released, during which the system retains the zero-speed torque current output. If there is obvious rollback at elevator startup, increase F3-19 properly.

The system retains the zero-speed torque current output within the time set in F8-11 from the moment when the system sends the brake apply command; this is to prevent rollback. If there is obvious rollback at elevator startup, increase F8-11 properly.

d) Handling of current noise at motor startup and stop

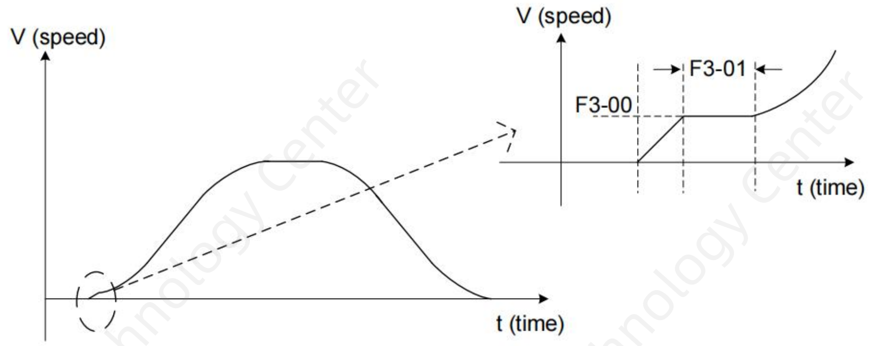
During elevator startup or stop, certain motors may generate noise when the current is applied before the brake is released or the current is removed after the brake is applied. To reduce motor noise, increase F2-16 or F2-17 properly.

Function Code	Name	Setting Range	Default
F2-16	Torque acceleration time	1 to 500	1
F2-17	Torque deceleration time	1 to 3000	350

e) Adjustment at large mechanical static friction

Function Code	Name	Setting Range	Default
F3-00	Startup speed	0.000–0.050 m/s	0.000m/s
F3-01	Startup holding time	0.000 to 5.000s	0.000s

Figure 5-16 Startup timing sequence for eliminating static friction

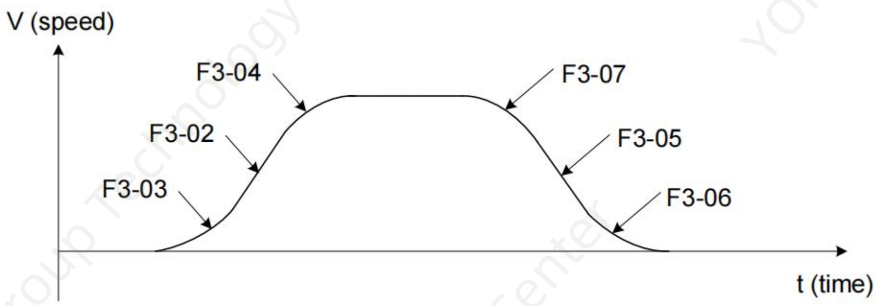


Bad riding comfort due to static friction may often exist in villa elevators. When there is large friction between the guide shoes and the guide rails, large static friction generates at the moment of startup, leading to bad riding comfort. Make the system starts up at the specified speed by setting these parameters to eliminate friction and improve riding comfort.

2) Riding comfort adjustment to the running curve

Function Code	Name	Setting Range	Default
F3-02	Acceleration rate	0.200 to 1.500	0.700
F3-03	Acceleration start jerk time	0.300 to 4.000	1.500
F3-04	Acceleration end jerk time	0.300 to 4.000	1.500
F3-05	Deceleration rate	0.200 to 1.500	0.700
F3-06	Deceleration end jerk time	0.300 to 4.000	1.500
F3-07	Deceleration start jerk time	0.300 to 4.000	1.500

Figure 5-17 Running curve



F3-02, F3-03, and F3-04 are used to set the running curve during which the elevator accelerates from startup to the maximum speed. If the acceleration process is too short causing bad riding comfort, decrease F3-02 and increase F3-03 and F3-04 to make the acceleration curve smoother. If the acceleration process is too long, increase the value of F3-02 and decrease the values of F3-03 and F3-04.

Adjust F3-05, F3-06, and F3-07 similarly to make the deceleration process appropriate.

2 Adjustment of mechanical construction

The mechanical construction affecting the riding comfort involves installation of the guide rail, guide shoe, steel rope, and brake, balance of the car, and resonance caused by the car, guild rail and motor. For asynchronous motor, abrasion or improper installation of the gearbox may arouse poor riding comfort.

No.	Mechanical Factor	Description
1	Guide rail	Installation of the guide rail mainly involves verticality and surface flatness of the guide rail, smoothness of the guide rail connection and parallelism between two guide rails (including guide rails on the counterweight side).
2	Guide shoe	Tightness of the guide shoes (including the one on the counterweight side) also influences the riding comfort. The guide shoes must not be too loose or tight.
3	Steel rope	The drive from the motor to the car totally depends on the steel rope. Large flexibility of the steel rope with irregular resistance during the car running may cause curly oscillation of the car. In addition, unbalanced stress of multiple steel ropes may cause the car to jitter during running.
4	Brake	The riding comfort during running may be influenced if the brake arm is installed too tightly or released incompletely.
5	Balance of the car	If the car weight is unbalanced, it will cause uneven stress of the guide shoes that connect the car and the guide rail. As a result, the guide shoes will rub with the guide rail during running, affecting the riding comfort.
6	Gearbox	For asynchronous motor, abrasion or improper installation of the gearbox may also affect the riding comfort.
7	Resonance caused by the car, guild rail and motor	Resonance is an inherent character of a physical system, related to the material and quality of system components. If you are sure that the oscillation is caused by resonance, reduce the resonance by increasing or decreasing the car weight or counterweight and adding resonance absorbers at connections of the components (for example, place rubber blanket under the motor).

5.6.2 Leveling Accuracy Adjustment

1 Description of leveling components

■ Leveling plate

The length of the leveling plate needs to match the leveling switch.

When the leveling switch runs across the leveling plate, each end of the leveling plate must protrudes over the leveling switch by at least 10 mm. All leveling plates must have the same length, with deviation smaller than 5 mm.

■ leveling switch

The leveling plate must be vertical to the leveling switch. When the car arrives, the leveling plate must be into the leveling switch by 2/3 of its own length.

■ Optoelectronic switch

The NO-type photoelectric switches are recommended to improve signal sensing stability.

2 Leveling accuracy adjustment methods

There are two leveling accuracy adjustment methods, described as follows:

■ All-floor adjustment

Function Code	Name	Setting Range	Default
F4-00	Leveling adjustment	0 to 60	30

F4-00 is used to adjust the car stop position at all floors and the default is 30. The setting of F4-00 is effective to all floors.

Increase F4-00 if under-leveling occurs at every floor and decrease F4-00 if over-leveling occurs at every floor.

■ Single-floor adjustment

Adjust the car stop position at each floor separately by setting group Fr parameters.

Leveling adjustment parameters in group Fr:

Function Code	Name	Setting Range	Default	Unit
Fr-00	Leveling adjustment function	0 to 1	0	-
Fr-01	Leveling adjustment record 1	00000 to 60060	30030	mm
Fr-02	Leveling adjustment record 2		30030	mm
to	to		to	to
Fr-28	Leveling adjustment record 28		30030	mm

The flowchart of single-floor leveling accuracy adjustment is shown in the following

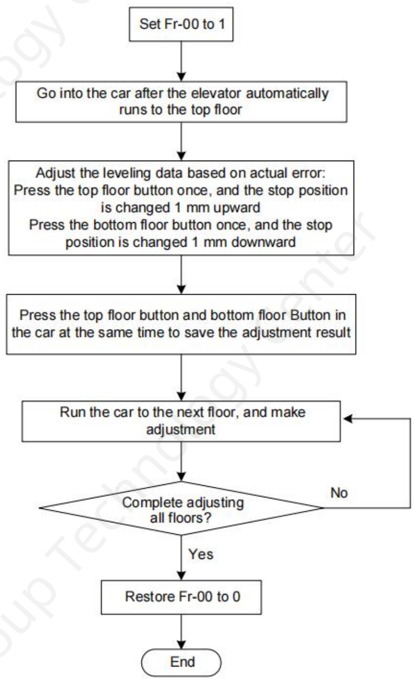


Figure 5-18 Single-floor leveling accuracy adjust

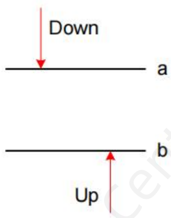
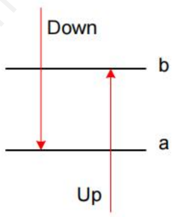
NOTE

- Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
- After you set Fr-00 to 1, the elevator shields hall calls, automatically runs to the top floor, and keeps the door open after arrival.
- During adjustment, the CCB displays "00" or the value after adjustment. Positive value: up arrow + value, negative value: down arrow + value, adjustment range: ±30 mm
- After you save the adjustment result, the CCB displays the present floor.
- Note that if a certain floor need not adjustment, you also need to save the data once. Otherwise, you cannot register the car call.

3 Leveling accuracy adjustment guidelines

- If the stop positions when the elevator arrives at each floor are fixed and the same in up and down directions and the car is not leveled with the hall sill, make adjustment for related floors by setting group Fr parameters.
- If the stop positions when the elevator arrives at each floor are fixed but different in up and down directions, make adjustment by setting both F4-00 and group Fr parameters. The specific adjustment method is as follows:

Firstly, adjust the leveling deviation at all floors by setting F4-00. Assume that the stop positions in down and up direction are respectively a and b, and perform the operation according to the following table.

Type	Diagram	Calculation	Adjustment Operation
Under-leveling		H = (a – b)/2	(F4-00) + H
Over-leveling		H = (b – a)/2	(F4-00) – H

Then, adjust the stop positions of related floors by setting group Fr parameters.

Pay attentions to the following precautions:

Prevent over-adjustment in group Fr parameters when the leveling deviation is too large.

Assume that when the car arrives at the leveling zone, the distance between the edge of the leveling sensor and the edge of the leveling plate is A, and the height deviation between the car sill and the hall sill upon car arrival is B. If B ⩾ A for a certain floor, you need to adjust the leveling plate position of this floor, to ensure that B ⩽ A upon car arrival. Otherwise, although you have adjusted the leveling accuracy by setting group Fr parameters, the elevator may still stop outside the leveling zone.

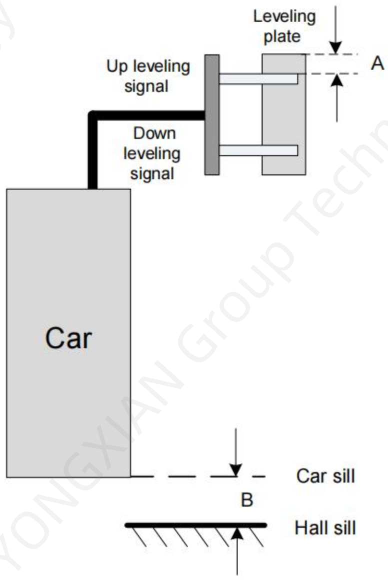


Figure 5-19 Leveling distance diagram

If the car stop position is not fixed at the same floor under different travels or loads, and height deviation between the car position and the hall sill are inconsistent at the same floor, it may be caused by improper speed loop parameters (group F2 parameters). To solve the problem, increase the speed loop proportional gain or decrease the speed loop integral time properly.

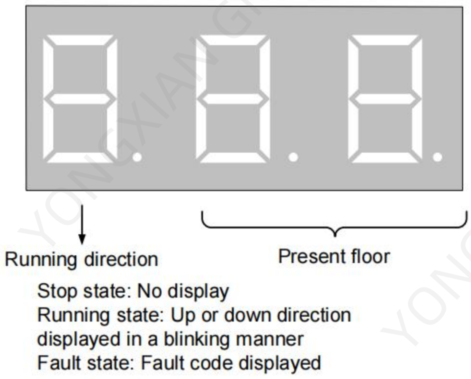
6 Parameter Description

6.1 Keypad

The parameters of the function menus displayed on the keypad are described as follows:

■ F0: display of floor and running direction

The F-0 menu is displayed on the keypad by default upon power-on. The first LED indicates the running direction, while the last two LEDs indicate the current floor number of the elevator. When the elevator stops, the first LED has no display. When the elevator runs, the first LED blinks to indicate the running direction. When a system fault occurs, the LEDs automatically display the fault code and blink. If the fault is reset automatically, the F-0 menu is displayed.



■ F-1: command input of the running floor

After you enter the F1 menu, the 7-segment LEDs display the bottom floor (F6-01). You can press the UP button to set the destination floor within the range of lowest to top and then press the SET button to save the setting. The elevator runs to the destination floor, and the display switches over to the F-0 menu at the same time.

■ F-2: fault reset and fault time and code display

After you enter the F-2 menu, the LEDs display "0". You can press the UP button to change the setting to 1 or 2.

Display "1": If you select this value and press the SET button, the system fault is reset. Then, the display automatically switches over to the F-0 menu.

Display "2": If you select this value and press the SET button, the 7-segment LEDs display the 10 fault codes and occurrence time circularly. You can press the PRG button to exit.

■ F-3: time display

After you enter the F-3 menu, the LEDs display the current system time circularly.

■ F-4: contract number display

After you enter the F-4 menu, the LEDs display the user's contract number.

■ F-5: running times display

After you enter the F-5 menu, the 7-segment LEDs display the elevator running times circularly.

■ F-6: door open/close control

After you enter the F-6 menu, the LEDs display "1-1", and the UP and SET buttons respectively stand for the door open button and door close button. You can press the PRG button to exit.

■ F-7: shaft auto-tuning command input

After you enter the F-7 menu, the LEDs display "0". You can select 0 to 2 here, where "1" and "2" indicate the shaft auto-tuning command (1. Clear no leveling adjustment parameters in group FR; 2. Clear leveling adjustment parameters in group FR).

After you select "1" or "2" and press the SET button, shaft auto-tuning is implemented if the conditions are met. Meanwhile, the display switches over to the F-0 menu. After shaft auto-tuning is complete, F-7 is back to "0" automatically. If shaft auto-tuning conditions are not met, fault code "E35" is displayed.

■ F-8: test function

After you enter the F-8 menu, the 7-segment LEDs display "0". The setting of F-8 is described as follows:

1	Hall call forbidden
2	Door open forbidden
3	Overload forbidden
4	Limit switches disabled
6	Entering slip experiment state
7	Manual test on UCMP
8	Manual test on braking force

After the setting is complete, press the SET button. Then the 7-segment LEDs display "E88" and blink, prompting that the elevator is being tested. When you press PRG to exit, F8 is back to 0 automatically.

■ F-9: reserved

■ F-A: auto-tuning

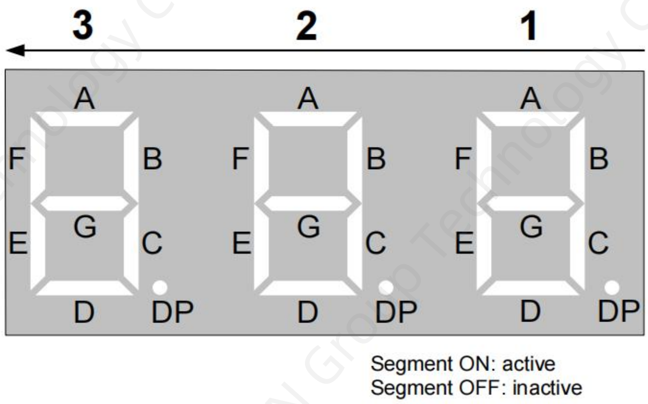
After you enter the F-A menu, the LEDs display “0”. The setting range of F-A is 1 and 2, as follows:

1	With-load Auto-tuning
2	No-load auto-tuning

After the setting is complete, press the SET button. Then the LEDs display "TUNE", and the elevator enters the auto-tuning state.
After confirming that the elevator meets the safe running conditions, press the SET button again to start auto-tuning.
After auto-tuning is complete, the LEDs display the present angle for 2s, and then switch over to the F-0 menu.
You can press the PRG button to exit the auto-tuning state.

■ F-b: CTB state display

After you enter the F-b menu, the LEDs display the input/output state of the CTB. The following figure shows the meanings of the segment codes:



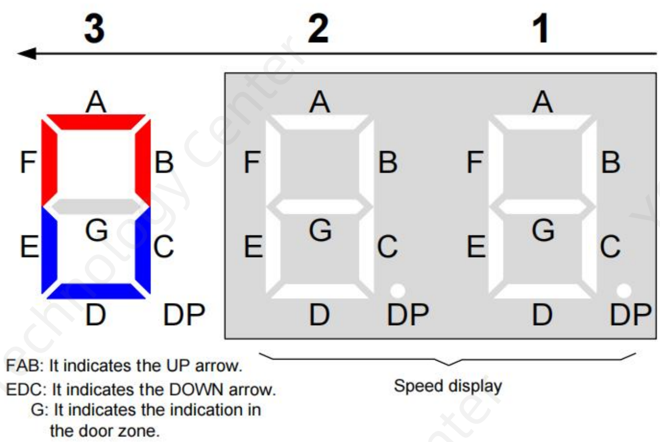
■ FC: elevator direction change (same as the function of F2-10)

0: Direction unchanged

1: Direction reversed

■ F-d: Emergency and test operation panel trigger

After you enter the F-b menu, the LEDs display the trigger state of the emergency and test operation panel. The following figure shows the meanings of the segment codes:



The system automatically goes to this interface in emergency evacuation or 12 V power supply or shutdown jerk state.

Note: When the speed is smaller than 1.000 m/s, the LEDs display ".xx m/s". When the speed is greater than 1 m/s, the LEDs display "x.x m/s". Therefore, the decimal places are different.

6.2 Operation Panel

The function codes adopt the three-level menu.

- The function code group is Level-I menu;
- The function code is Level-II menu;
- The function code setting is Level-III menu.

1 Meaning of each column in the function code table

Function Code	Name	Setting Range	Default	Unit	Property
Parameter No.	Full name of parameter	Effective set value range of parameter	Factory default of parameter	Unit of measurement of parameter	Operation property of parameter (That is, whether to allow operation and conditions)

" ☆ ": The parameter can be modified when the controller is in either stop or running state.

" ★ ": The parameter cannot be modified when the controller is in the running state.

" ● ": The parameter is the actually measured value and cannot be modified.

The system automatically restricts the modification property of all parameters to prevent mal-function.

2 Function code groups

On the operation panel, press PRG and then △ / ▽ , and you can view the function code groups. The function code groups are classified as follows:

F0	Basic parameters	FA	Keypad setting parameters
F1	Motor parameters	Fb	Door function parameters
F2	Vector control parameters	FC	Protection function parameters
F3	Running control parameters	Fd	Communication parameters
F4	Floor parameters	FE	Display setting parameters
F5	Terminal function parameters	FF	Factory parameters (reserved)
F6	Basic elevator parameters	FP	User parameters
F7	Test function parameters	Fr	Leveling adjustment parameters
F8	Enhanced function parameters	E0 to E9	Fault record parameters
F9	Time parameters	FJ	Factory parameters (reserved)

Group F0: Basic parameters

Function Code	Name	Setting Range	Default	Unit	Property
F0-00	Control mode	0: Sensorless vector control (SVC) 1: Closed-loop vector control (CLVC) 2: Voltage/Frequency (V/F) control	1	-	★

It is used to set the control mode of the system, as described in the following table.

Value	Control mode	Function	Require Encoder?
0	Sensorless vector control (SVC)	It is applicable to: Low-speed running during no-load commissioning and fault judgment at inspection of the asynchronous motor Synchronous motor running on special conditions (used only by professional engineers, not described in this manual)	No
1	Closed-loop vector control (CLVC)	It is applicable to normal running in distance control.	Yes
2	Voltage/ Frequency (V/F) control	It is applicable to equipment detection (the ratio between the voltage and the frequency is fixed, control is simple, and the low-frequency output torque feature is poor).	No

Function Code	Name	Setting Range	Default	Unit	Property
F0-01	Command source selection	0: Operation panel control 1: Distance control	1	-	★

It is used to set the source of running commands and running speed references, as described in the following table.

Value	Running Mode	Working Mode		Purpose	Remarks
		X Input	Y Output		
0	Operation panel control	Not detect X input signals	Not output (The relay for the RUN contactor will output during motor auto-tuning.)	Used only during motor test or no-load auto-tuning	The controller is operated by pressing RUN and STOP on the operation panel, and the running speed is set by F0-02 (Running speed under operation panel control)

Value	Running Mode	Working Mode		Purpose	Remarks
		X Input	Y Output		
1	Distance control	Detect X input signals	Output	Used during normal elevator running	1. During inspection, the elevator runs at the speed set in F3-11. 2. During normal running, the controller automatically calculates the speed and running curve for the elevator based on the distance between the current floor and the destination floor within the rated elevator speed, implementing direct travel ride.

Function Code	Name	Setting Range	Default	Unit	Property
F0-02	Running speed under operation panel control	0.050 to F0-04	0.050	m/s	☆
F0-03	Maximum running speed	0.250 to F0-04	1.600	m/s	★
F0-04	Rated elevator speed	0.250 to 4.000	1.600	m/s	★

F0-02 is used to set the running speed in the operation panel control mode.

F0-03 is used to set the actual maximum running speed of the elevator. The value must be smaller than the rated elevator speed (F0-04).

F0-04 is used to set the nominal rated speed of the elevator. The value of this parameter is dependent on the elevator mechanism and traction motor and shall not be changed without authorization.

Function Code	Name	Setting Range	Default	Unit	Property
F0-05	Rated elevator load	300 to 9999	1000	kg	★

The rated load is used in the anti-nuisance function.

Function Code	Name	Setting Range	Default	Unit	Property
F0-06	Maximum frequency	F1-04 to 99.00	50.00	Hz	★

It is used to set the maximum output frequency of the system. This value must be larger than the rated motor frequency.

Function Code	Name	Setting Range	Default	Unit	Property
F0-07	Carrier frequency	0.5 to 16.0	6.0	kHz	★

It is used to set the carrier frequency of the controller.

The carrier frequency is closely related to the motor noise during running. When it is generally set above 6 kHz, mute running is achieved. It is recommended to set the carrier frequency to the lowest within the allowable noise, which reduces the controller loss and radio frequency interference.

When the carrier frequency reduces, the following factors also increase:

- Higher harmonics of output current
- Motor power loss
- Motor temperature rise

When the carrier frequency increases:

- Motor power loss and temperature rise declines.
- Power loss, system temperature rise and interference increase.

Adjusting the carrier frequency will exert influences on the aspects listed in the following table.

Carrier frequency	Low to High
Motor noise	Large to Small
Output current waveform	Bad to Good
Motor temperature rise	High to Low
Controller temperature rise	Low to High
Leakage current	Small to Large
External radiation interference	Small to Large

Group F1: Motor parameters

Function Code	Name	Setting Range	Default	Unit	Property
F1-00	Encoder type	0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: Endat absolute encoder	0	-	★

Select an appropriate F1-00 parameter value according to the motor encoder type.

When F1-25 is set to 1 (Synchronous motor), set this parameter correctly before auto-tuning; otherwise, the motor cannot run properly.

When F1-25 is set to 0 (Asynchronous motor), this parameter is automatically changed to 2. You need not modify it manually.

F1-12 is used to set the pulses per revolution of the encoder (according to the encoder nameplate).

Function Code	Name	Setting Range	Default	Unit	Property
F1-01	Rated motor power	0.7 to 75.0	Model dependent	kW	★
F1-02	Rated motor voltage	0 to 600	Model dependent	V	★
F1-03	Rated motor current	0.00 to 655.00	Model dependent	A	★
F1-04	Rated motor frequency	0.00 to F0-06	Model dependent	Hz	★
F1-05	Rated motor speed	0 to 3000	Model dependent	RPM	★

Set these parameters according to the motor type and motor nameplate.

Function Code	Name	Setting Range	Default	Unit	Property
F1-06	Encoder initial angle (synchronous motor)	0.0 to 359.9	0	°	★
F1-07	Encoder angle at power-off (synchronous motor)	0.0 to 359.9	0	°	★
F1-08	Synchronous motor wiring mode	0 to 15	0	-	★

These parameters are obtained by means of motor auto-tuning.

F1-06 specifies the encoder angle at zero point. After multiple times of auto-tuning, compare the obtained values, and the value deviation of F1-06 shall be within ±5°

F1-07 specifies the angle of the magnetic pole when the motor is powered off. The value is recorded at power-off and is used for comparison at next power-on.

F1-08 specifies the motor wiring mode, that is, whether the output phase sequence of the drive board is consistent with the UVW phase sequence of the motor. If the value obtained by means of no-load auto-tuning is an even number, the phase sequence is correct. If the value is an odd number, the sequence is incorrect; in this case, exchange any two of UWW phases of the motor.

F0-06 and F0-08 can be modified only when F0-01 is set to 0.

Function Code	Name	Setting Range	Default	Unit	Property
F1-09	Current filter time (synchronous motor)	0.0 to 359.9	0	-	★

F1-09 is used to set the current filter time, which suppresses the periodic vertical jitter. Increase the value in ascending order of 5 to achieve the optimum effect.

Function Code	Name	Setting Range	Default	Unit	Property
F1-10	Encoder verification selection	0 to 65535	0	-	★

F1-10 is used to set encoder signal verification. This parameter is set by the manufacturer, and you need not modify it generally.

Function Code	Name	Setting Range	Default	Unit	Property
F1-11	Auto-tuning mode	0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning 1 4: Shaft auto-tuning 2 5: Synchronous motor static auto-tuning	0	-	★

It is used to select the auto-tuning mode. The values are as follows:

- 0: No operation;
- 1: With-load auto-tuning: static auto-tuning for asynchronous motor and rotary auto-tuning for synchronous motor;
- 2: No-load auto-tuning;
- 3: Shaft auto-tuning 1, cleaning no parameters in group FR;
- 4: Shaft auto-tuning 2, cleaning parameters in group FR;
- 5: Synchronous motor static auto-tuning.

Function Code	Name	Setting Range	Default	Unit	Property
F1-12	Encoder pulses per revolution	0 to 10000	2048	PPR	★

F1-12 is used to set the pulses per revolution of the encoder (according to the encoder nameplate).

Function Code	Name	Setting Range	Default	Unit	Property
F1-13	Encoder wire-breaking detection time	0 to 10.0	2.1	s	★

F1-13 is used to set the time that a wire-break fault lasts before being detected.

After the elevator starts running at non-zero speed, if there is no encoder signal input within the time set in this parameter, the system prompts the encoder fault and stops running. When the value is smaller than 0.5s, this function is disabled.

Function Code	Name	Setting Range	Default	Unit	Property
F1-14	Stator resistance (asynchronous motor)	0.000 to 30.000	Model dependent	Ω	★
F1-15	Rotor resistance (asynchronous motor)	0.000 to 30.000	Model dependent	Ω	★
F1-16	Leakage inductance (asynchronous motor)	0.00 to 300.00	Model dependent	mH	★
F1-17	Mutual inductance (asynchronous motor)	0.1 to 3000.0	Model dependent	mH	★
F1-18	No-load current (asynchronous motor)	0.01 to 300.00	Model dependent	A	★

These parameters are obtained by means of asynchronous motor auto-tuning. After the motor auto-tuning is completed successfully, the values of these parameters are updated automatically. If motor auto-tuning cannot be performed on site, manually enter the values by referring to data of the motor with the same nameplate parameters.

Each time F1-01 (Rated motor power) of the asynchronous motor is modified, these parameters automatically resume to the default values for the standard motor.

Function Code	Name	Setting Range	Default	Unit	Property
F1-19	Shaft Q inductance (torque)	0.00 to 650.00	3.00	mH	★
F1-20	Shaft D inductance (excitation)	0.00 to 650.00	3.00	mH	★
F1-21	Back EMF coefficient	0 to 65535	0	-	★

F1-19 to F1-21 are used to display the Shaft D and Q inductances and Back EMF coefficient of the synchronous motor obtained by means of motor auto-tuning.

Function Code	Name	Setting Range	Default	Unit	Property
F1-22	Auto-tuning function selection	Bit1 = 1, Bit2 = 0: Semi-automatic angle-free auto-tuning Bit1 = 1, Bit2 = 1: Full-automatic angle-free auto-tuning	0	-	★

Bit1 and Bit2 is used to select the angle-free auto-tuning mode of the synchronous motor.

Bit1 = 1, Bit2 = 0: Semi-automatic angle-free auto-tuning

After power-off and power-on again, the system automatically performs encoder angle auto-tuning only during running at inspection speed. After auto-tuning is successful, the system does not perform auto-tuning again before the next power-off.

Tip: The fault Err19 is reported if the system is powered off and powered on again without finishing auto-tuning during running at inspection speed and the elevator enters the normal state.

Bit1 = 1, Bit2 = 1: Full-automatic angle-free auto-tuning

After power-off and power-on again, the system automatically performs encoder angle auto-tuning during elevator running at inspection/normal speed. After auto-tuning is successful, the system does not perform auto-tuning again before the next power-off.

Function Code	Name	Setting Range	Default	Unit	Property
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor	1	-	★

This parameter is used to select the motor type. The values are as follows:

- 0: Asynchronous motor
- 1: Synchronous motor

Group F2: Vector control parameters

Function Code	Name	Setting Range	Default	Unit	Property
F2-00	Speed loop proportional gain Kp1	0 to 100	40	-	★
F2-01	Speed loop integral time Ti1	0.01 to 10.00	0.60	s	★
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	★
F2-03	Speed loop proportional gain Kp2	0 to 100	35	-	★
F2-04	Speed loop integral time Ti2	0.01 to 10.00	0.80	s	★
F2-05	Switchover frequency 2	F2-02 to F0-06	5.00	Hz	★

F2-00 and F2-01 are PI regulation parameters when the running frequency is smaller than the value of F2-02 (Switchover frequency 1).

F2-03 and F2-04 are PI regulation parameters when the running frequency is larger than the value of F2-05 (Switchover frequency 2).

If the running frequency is between F2-02 and F2-05, the speed loop PI parameters are obtained from the weighted average value of the two groups of PI parameters (F2-00, F2-01 and F2-03, F2-04), as shown in Figure 6-1.

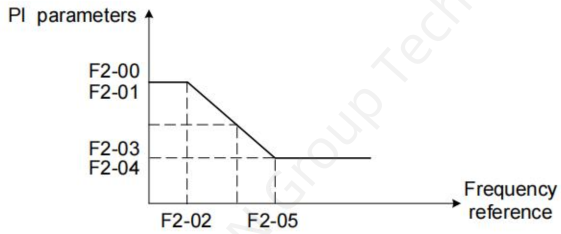


Figure 6-1 Relationship between running frequencies and PI parameters

The speed dynamic response characteristics in vector control can be adjusted by setting the proportional gain and integral time of the speed regulator. To achieve a faster system response, increase the proportional gain and reduce the integral time. Be aware that this may lead to system oscillation.

The recommended adjustment method is as follows:

If the default setting cannot meet the requirements, make proper adjustment. Decrease the proportional gain first to ensure that the system does not oscillate, and then reduce the integral time to ensure that the system has quick response but small overshoot.

If both F2-02 (Switchover frequency 1) and F2-05 (Switchover frequency 2) are 0, only F2-03 and F2-04 are valid.

Function Code	Name	Setting Range	Default	Unit	Property
F2-06	Current loop proportional gain Kp	10 to 500	60	-	★
F2-07	Current loop integral gain Ki	10 to 500	30	-	★

These two parameters are regulation parameters for the torque axis current loop.

These parameters are used as the torque axis current regulator in vector control. The best values of the parameters matching the motor characteristics are obtained by means of motor auto-tuning. You need not modify them generally.

Function Code	Name	Setting Range	Default	Unit	Property
F2-08	Torque upper limit	0.0 to 200.0	200.0	%	★

It is used to set the torque upper limit of the motor. The value 100% corresponds to the rated output torque of the applicable motor.

Function Code	Name	Setting Range	Default	Unit	Property
F2-10	Elevator running direction	0 to 1	0	-	★

It is used to set the elevator running direction. The values are as follows:

- 0: Direction unchanged
- 1: Direction reversed

You can modify this parameter to reverse the running direction (without changing the wiring of the motor). When you perform inspection running for the first time after motor auto-tuning is successful, check whether the actual motor running direction is consistent with the inspection command direction. If not, change the motor running direction by setting F2-10 to be consistent with the inspection command direction.

Pay attention to the setting of this parameter when restoring the default setting.

Function Code	Name	Setting Range	Default	Unit	Property
F2-11	Zero servo current coefficient	2.0 to 50.0	15.0	%	★
F2-12	Zero servo speed loop Kp	0.00 to 2.00	0.50	-	★
F2-13	Zero servo speed loop Ti	0.00 to 2.00	0.60	-	★

These parameters are used to adjust automatic pre-torque compensation in the case of no-load-cell. The no-load-cell startup function is enabled when F8-01 is set to 2 or 3.

Decrease the values of these parameters in the case of car lurch at startup, and increase the values in the case of rollback at startup.

Function Code	Name	Setting Range	Default	Unit	Property
F2-16	Torque acceleration time	1 to 500	1	ms	★
F2-17	Torque deceleration time	1 to 3000	350	ms	★

These two parameters are used to set the acceleration time and deceleration time of the torque current.

Due to the difference of motor features:

1. If the motor has abnormal sound when the current is applied at startup, increase the value of F2-16 to eliminate the abnormal sound.

2. If the motor has abnormal sound when the current is withdrawn at stop, increase the value of F2-17 to eliminate the abnormal sound.

Group F3: Running control parameters

Function Code	Name	Setting Range	Default	Unit	Property
F3-00	Startup speed	0.000 to 0.050	0.000	m/s	★
F3-01	Startup speed holding time	0.000 to 5.000	0.000	s	★

These two parameters are used to set the startup speed and startup speed holding time of the system. Refer to Figure 6-2 Running speed curve.

The parameters may reduce the terrace feeling at startup due to static friction between the guide rail and the guide shoes.

Function Code	Name	Setting Range	Default	Unit	Property
F3-02	Acceleration rate	0.200 to 1.500	0.700	m/s^2	★
F3-03	Acceleration start jerk time	0.300 to 4.000	1.500	s	★
F3-04	Acceleration end jerk time	0.300 to 4.000	1.500	s	★

F3-02, F3-03, and F3-04 are used to set the running curve during acceleration of the elevator, as shown in Figures 6-2 and 6-3.

F3-02 is the acceleration rate of the elevator speed curve (uniform acceleration segment).

F3-03 is the time for the rate to increase from 0 to the value set in F3-02 in the speed curve (start jerk segment). The larger the value is, the smoother the jerk is.

F3-04 is the time for the rate to decrease from the value set in F3-02 to 0 in the speed curve (end jerk segment). The larger the value is, the smoother the jerk is.

Function Code	Name	Setting Range	Default	Unit	Property
F3-05	Deceleration rate	0.200 to 1.500	0.700	m/s^2	★
F3-06	Deceleration end jerk time	0.300 to 4.000	1.500	s	★
F3-07	Deceleration start jerk time	0.300 to 4.000	1.500	s	★

F3-05, F3-06, and F3-07 are used to set the running curve during deceleration of the elevator, as shown in Figures 6-2 and 6-3.

F3-05 is the acceleration rate of the elevator speed curve (uniform deceleration segment).

F3-06 is the time for the rate to decrease from the value set in F3-05 to 0 in the speed curve (end jerk segment). The larger the value is, the smoother the jerk is.

F3-07 is the time for the rate to increase from 0 to the value set in F3-05 in the speed curve (start jerk segment). The larger the value is, the smoother the jerk is.

Figure 6-2 shows the settings of the entire running curve.

F3-02 (F3-05) is the acceleration (deceleration) rate of the speed curve in the linear acceleration process.

F3-03 (F3-07) is the time for the rate to change from 0 to the value set in F3-02 (F3-05) in the speed curve (start jerk segment). The larger the value is, the smoother the jerk is.

F3-04 (F3-06) is the time for the rate to decrease from the value set in F3-02 (F3-05) to 0 in the speed curve (end

jerk segment). The larger the value is, the smoother the jerk is.

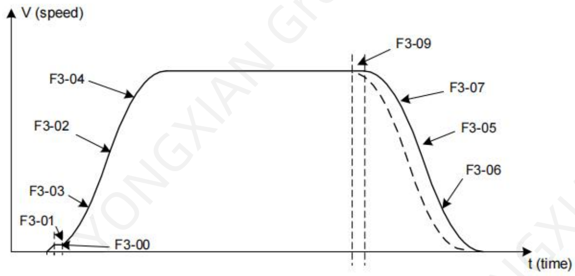


Figure 6-2 Running speed curve

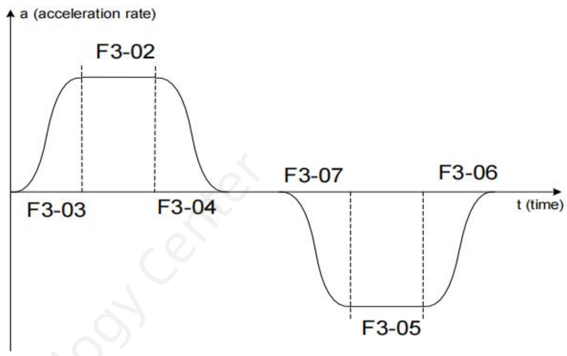


Figure 6-3 Acceleration rate curve

Function Code	Name	Setting Range	Default	Unit	Property
F3-08	Special deceleration rate	0.200 to 1.500	0.900	m/s^2	★

F3-08 is used to set the deceleration rate in elevator level 4 fault, inspection, shaft auto-tuning, re-leveling, and terminal floor verification.

This parameter is not used during normal running. It is used only when the elevator position is abnormal or the slow-down signal is abnormal, preventing over travel top terminal or over travel bottom terminal.

Function Code	Name	Setting Range	Default	Unit	Property
F3-09	Pre-deceleration distance	0 to 90.0	0.0	mm	★

F3-09 is used to set the pre-deceleration distance of the elevator in distance control, as shown in Figure 6-2. This function is to eliminate the effect of encoder signal loss or leveling signal delay.

Function Code	Name	Setting Range	Default	Unit	Property
F3-10	Re-leveling speed	0.020 to 0.080	0.040	m/s	★

F3-10 is used to set the elevator speed during re-leveling.

This parameter is valid only when the pre-open module (MCTC-SCB-A) is added to implement the re-leveling function (set in FE-32).

Function Code	Name	Setting Range	Default	Unit	Property
F3-11	Inspection speed	0.100 to 0.630	0.250	m/s	★

F3-11 is used to set the elevator speed during inspection.

Function Code	Name	Setting Range	Default	Unit	Property
F3-12	Position of up slow-down 1	0.00 to 300.00	0.00	m	★
F3-13	Position of down slow-down 1	0.00 to 300.00	0.00	m	★
F3-14	Position of up slow-down 2	0.00 to 300.00	0.00	m	★
F3-15	Position of down slow-down 2	0.00 to 300.00	0.00	m	★
F3-16	Position of up slow-down 3	0.00 to 300.00	0.00	m	★
F3-17	Position of down slow-down 3	0.00 to 300.00	0.00	m	★

F3-12 to F3-17 specify the positions of all slow-down switches relative to the bottom leveling position, and the positions are automatically recorded during shaft auto-tuning. For the installation positions of the slowdown switches, see 2.4.2 Slow-Down Switches.

The NICE3000^{new} supports a maximum of three pairs of slow-down switches. From two sides of the shaft to the middle, slow-down 1, slow-down 2, and slow-down 3 are installed in order; that is, slow-down 1 is installed near the terminal floor. There may be only one pair of slow-sown switches for the low-speed elevator, and two or three pairs of slow-down switches for the high-speed elevator.

The system automatically detects the speed when the elevator reaches a slow-down switch. If the detected speed or position is abnormal, the system enables the elevator to slow down at the special deceleration rate set in F3-08, preventing over travel top terminal or over travel bottom terminal.

Function Code	Name	Setting Range	Default	Unit	Property
F3-18	Zero-speed control time at startup	0.200 to 1.000	0.200	s	★
F3-19	Brake release delay	0.000 to 2.000	0.600	s	★
F3-20	Zero-speed control time at end	0.000 to 1.000	0.300	s	★

F3-18 to F3-20 are used to set the time related to the zero-speed holding current output and braking action delay.

F3-18 (Zero-speed control time at startup) specifies the time from output of the RUN contactor to output of the brake contactor, during which the controller performs excitation on the motor and outputs zero-speed current with large startup torque.

F3-19 (Brake release delay) specifies the time from the moment when the system sends the brake release command to the moment when the brake is completely released, during which the system retains the zero-speed torque current output.

F3-20 (Zero-speed control time at end) specifies the zero-speed output time when the running curve ends.

The following figure shows the running time sequence.

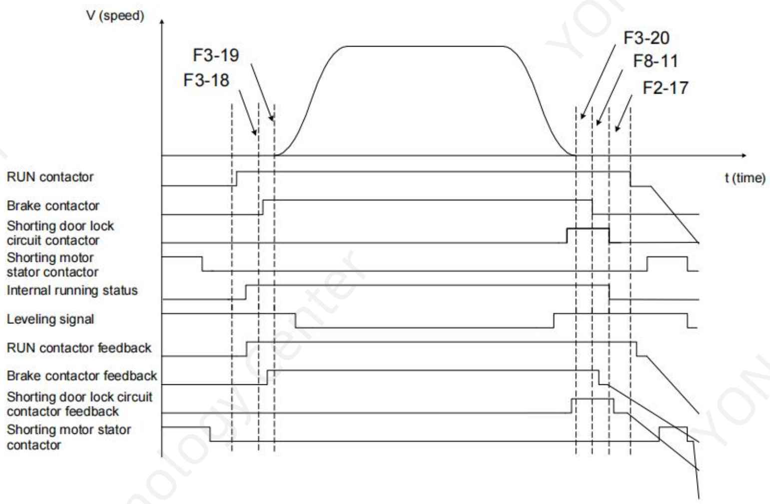


Figure 6-4 Running time sequence

NOTE

◆ The system retains the zero-speed torque current output within the time set in F8-11 from the moment when the system sends the brake apply command; this is to prevent rollback.

Function Code	Name	Setting Range	Default	Unit	Property
F3-21	Low-speed re-leveling speed	0.080 to F3-11	0.100	m/s	★

F3-21 is used to set the elevator speed of returning to the leveling position at normal non-leveling stop.

Function Code	Name	Setting Range	Default	Unit	Property
F3-22	Acceleration rate at emergency evacuation	0.300 to 1.300	0.300	m/s^2	★

F3-22 is used to set the acceleration rate at emergency evacuation.

Function Code	Name	Setting Range	Default	Unit	Property
F3-23	Slow-down delay deceleration time	0.00 to 10.00	0	s	★

F3-23 indicates that the speed is reduced to 0.1 m/s within this time in case of slow-down delay during inspection, re-leveling, terminal floor verification and shaft auto-tuning.

Function Code	Name	Setting Range	Default	Unit	Property
F3-24	Program function selection	0: Reserved 1: Slip experiment function enabled 2: UCMP test function enabled	0	-	★

This parameter is used when the motor slip experiment is performed during elevator acceptance. If the slip experiment onsite is not successful, set this parameter to 1 to enable the slip experiment function. After the experiment is completed, set F3-24 to 0 to disable the function. When F3-24 is set to 2, it indicates that the UCMP test is performed.

Function Code	Name	Setting Range	Default	Unit	Property
F3-25	Emergency electric RUN speed	0.100 to 0.300	0.250	m/s	★

F3-25 is used to set the elevator speed during emergency drive running.

Function Code	Name	Setting Range	Default	Unit	Property
F3-26	Shaft auto-tuning speed	0.250 to 0.630	0.250	m/s	★

F3-26 is used to set the elevator speed during shaft auto-tuning.

Group F4: Floor parameters

Function Code	Name	Setting Range	Default	Unit	Property
F4-00	Leveling adjustment	0 to 60	30	mm	★

F4-00 is used to adjust the leveling accuracy at elevator stop.

If over-leveling occurs at all floors during elevator stop, decrease the value of this parameter properly. If under-leveling occurs at all floors during elevator stop, increase the value of this parameter properly. This parameter takes effect to leveling of all floors. Therefore, if leveling at a single floor is inaccurate, adjust the position of the leveling plate or refer to the description of leveling adjustment in group Fr. The NICE-3000^{new} has the advanced distance control algorithm and adopts many methods to ensure reliability of direct travel ride. Generally you need not modify this parameter.

Function Code	Name	Setting Range	Default	Unit	Property
F4-01	Current floor	F6-01 to F6-00	1	-	★

F4-01 indicates the current floor of the elevator car.

The system automatically changes the value of this parameter during running, and corrects it at leveling

position (door open limit) after the up slow-down and down slow-down switches act. At non-bottom floor and top-floor leveling, you can also manually modify this parameter, but the value must be consistent with the actual current floor.

Function Code	Name	Setting Range	Default	Unit	Property
F4-02	High byte of current floor position	0 to 65535	1	Pulses	●
F4-03	Low byte of current floor position	0 to 65535	34464	Pulses	●

F4-02 and F4-03 indicate the absolute pulses of the current position of the elevator car relative to the bottom leveling position.

The position data of the NICE3000^{new} in the shaft is recorded in pulses. Each position is expressed by a 32-bit binary number, where the high 16 bits indicate the high byte of the floor position, and the low 16 bits indicate the low byte of the floor position.

Function Code	Name	Setting Range	Default	Unit	Property
F4-04	Length 1 of leveling plate	0 to 65535	0	Pulses	★
F4-05	Length 2 of leveling plate	0 to 65535	0	Pulses	★

F4-04 indicates the pulses corresponding to the leveling plate length.

F4-05 indicates the pulses corresponding to the sum of the distances between the up and down leveling switches and two ends of the leveling plate.

These two parameters are automatically recorded during shaft auto-tuning.

For the relationship between the two parameters, see 2.4.1 Leveling Signals.

Function Code	Name	Setting Range	Default	Unit	Property
F4-06	High byte of floor height 1	0 to 65535	0	Pulses	★
F4-07	Low byte of floor height 1	0 to 65535	0	Pulses	★
High and low bytes of floor height 2 to floor height 38					
F4-82	High byte of floor height 39	0 to 65535	0	Pulses	★
F4-83	Low byte of floor height 39	0 to 65535	0	Pulses	★

These parameters indicate the pulses corresponding to the floor height i (between the leveling plates of floor n and floor i+1). Each floor height is expressed by a 32-bit binary number, where the high 16 bits indicate the high byte of the floor height, and the low 16 bits indicate the low byte of the floor height. On normal conditions, the floor height i of each floor is almost the same.

Group F5: Terminal function parameters

Function Code	Name	Setting Range	Default	Unit	Property
F5-00	Attendant/Automatic switchover time	3 to 200	3	s	★

If there is a hall call at non-current floor in attendant state, the system automatically switches over to the automatic (normal) state after the time set in this parameter. After this running is completed, the system automatically restores to the attendant state (F6-43 Bit2 must be set to 1).
When the value of this parameter is smaller than 5, this function is disabled, and the system is in the normal attendant state.

Function Code	Name	Setting Range	Default	Unit	Property
F5-01	X1 function selection	0 to 127	33	-	★
F5-02	X2 function selection		35	-	★
F5-03	X3 function selection		34	-	★
...			...		
F5-23	X23 function selection		00	-	★
F5-24	X24 function selection		00	-	★

F5-01 to F5-24 are used to set the signals input to DI terminals X1 to X24. Select corresponding input parameters according to different functions of input signals.

The NICE3000^{new} provides 24 low-voltage DIs (X1 to X24), 3 high-voltage DIs (X25 to X27), and 1 AI (Ai/M). All low-voltage inputs share the COM terminal; when the 24 VDC voltage is applied, the corresponding input indicator becomes ON.

The following parameter values list the functions that can be set for DI terminals. If a certain function cannot be set, check whether this function has been allocated to another terminal or is running.

NOTE

Parameter values that can be set repeatedly

◆ 04/36: Safety circuit feedback NO/NC; 05/37: Door lock circuit feedback NO/NC; 06/38: RUN contactor feedback NO/NC; 07/39: Brake contactor feedback NO/NC; 26/58: Brake travel switch 1 NO/NC

The meanings of the NO setting of the functions is as follows (NO value + 32 for the NC setting).

■ 00: Invalid

Even if there is signal input to the terminal, the system has no response. You can allocate this signal to terminals that are not used to prevent malfunction.

■ 01: Up leveling signal

■ 02: Down leveling signal

■ 03: Door zone signal

The NICE3000^{new} system determines the elevator leveling position based on the leveling switch signal. The system supports three types of leveling configurations: single door zone switch, up and down leveling switches, and door zone switch plus the up/down leveling switch. If three leveling switches are used, the system successively receives "up leveling signal --> door zone signal --> down

leveling signal" in up direction and "down leveling signal --> door zone signal --> up

leveling signal" in down direction. If two leveling switches (up and down leveling switches) are used, the system successively receives "up leveling signal --> down

leveling signal" in up direction and "down leveling signal --> up leveling signal" in down direction. If the leveling signal is abnormal (stuck or unavailable), the system reports fault Err22.

■ 04: Safety circuit feedback

■ 05: Door lock circuit 1 feedback

■ 29: Safety circuit 2 feedback

■ 31: Door lock circuit 2 feedback

The safety circuit is important to safe and reliable running of the elevator, and the door lock circuit ensures that the hall door and car door are closed before the elevator starts to run. Valid feedback signals of the safety circuit and door lock circuit are necessary to elevator running.
It is recommended that these signals are set to NO input. If they are set to NC input, the system considers

the input active even though there is no input. In this case, the actual state of the safety circuit cannot be detected, which may cause potential safety risks.

■ 06: RUN contactor feedback

■ 07: Brake contactor feedback

- 26: Brake travel switch 1 input
- 78: Brake travel switch 2 input

The system sends commands to the RUN and brake contactors and automatically detects the feedback from the RUN and brake contactors. If the commands and the feedback are inconsistent, the system reports a fault.

- 08: Inspection signal
- 09: Inspection/emergency drive up signal
- 10: Inspection/emergency drive down signal
- 84: Emergency drive

1. When 08/40 (inspection signal) is set at input terminal X, the inspection switch signal is given to the system in the DI form. When 08/40 (inspection signal) is not set at input terminal X, the inspection switch signal is transmitted to the system via CAN communication (MCTC-CTW-A must be used at the car top).

2. When the inspection or emergency drive switch is active, the elevator enters the inspection or emergency drive state; in this case, the system cancels all automatic running including the automatic door actions. When the up signal or down signal is valid, the elevator runs at the speed set in F3-26 in emergency drive state or at the speed set in F3-11 in inspection state.

3. The inspection signal takes precedence over the emergency drive signal. When both signals are active, the elevator runs by inspection method.

- 11: Fire emergency signal

When the fire emergency switch is turned on, the elevator enters the fire emergency state, and immediately cancels the registered hall calls and car calls. The elevator directly runs to the fire emergency floor and automatically opens the door after arrival.

- 12: Up limit signal
- 13: Down limit signal

When the elevator runs over the leveling position of the terminal floor but does not stop, the up limit signal and down limit signal are used as the stop switches at the terminal floors to prevent over travel top terminal or over travel bottom terminal.

- 14: Overload signal

When the elevator load exceeds 110% of the rated load during normal use, the elevator enters the overload state. Then the overload buzzer beeps, the overload indicator in the car becomes ON, and the elevator door keeps open. The overload signal becomes invalid when the door lock is applied. If the running with 110% of the rated load is required during inspection, you can set F7-06 to 1 to allow overload running (note that this function has potential safety risks and use it with caution).

It is recommended that the overload signal be set to NC input. If it is set to NO, the system cannot detect the overload state when the overload switch is damaged or the connection is broken, and the elevator running in this case may cause potential safety risks. It is also recommended that the up limit signal, down limit signal, and slow-down signal are set to NC input.

- 15: Full-load signal

When the elevator load is 80% to 110% of the rated load, the HCB displays the full-load state, and the elevator does not respond to hall calls.

- 16: Up slow-down 1 signal
- 17: Down slow-down 1 signal
- 18: Up slow-down 2 signal
- 19: Down slow-down 2 signal
- 20: Up slow-down 3 signal
- 21: Down slow-down 3 signal

These parameters are used to set corresponding input terminals to slow-down Dis. The slow-down signals are used to enable the elevator to stop at the slow-down speed when the car position is abnormal, which is an important method to guarantee elevator safety. The NICE3000^{new} system automatically records the positions of the switches in group F3 during shaft auto-tuning.

- 22: Shorting door lock circuit contactor feedback

It is the feedback signal when the door lock circuit is shorted if the function of door pre-open upon arrival or re-leveling at door open is enabled for the elevator configured with the pre-open module. This is to ensure safety during the elevator running.

- 23: Firefighter running signal

It is the firefighter switch signal and is used to enable the firefighter running. After the elevator returns to the fire emergency floor, the elevator enters the firefighter running state if the firefighter signal is active.

- 24: Door machine 1 light curtain signal
- 25: Door machine 2 light curtain signal

They are used to detect the light curtain signals of door machine 1 and door machine 2 (if existing).

- 26: Brake travel switch 2 feedback
- 27: Emergency evacuation signal

It is the emergency running signal at power failure. If it is active, it indicates that the elevator is running for emergency evacuation at power failure.

- 28: Elevator lock signal

If this signal is active, the elevator enters the locked state, returns to the elevator lock floor and does not respond to any calls until the signal becomes inactive. It has the same function as the hall call elevator lock signal (For details, see Fd-07 and Fd-08).

- 30: Shorting PMSM stator feedback

The shorting PMSM stator contactor protects the elevator from falling at high speed in the case of brake failure. This signal is used to monitor whether the shorting PMSM stator contactor is normal.

- 65: Door machine 1 safety edge signal
- 66: Door machine 2 safety edge signal

They are used to detect the safety edge signal state of door machine 1 and door machine 2 (if existing).

■ 67: Motor overheat signal

It is the motor thermal protection switch DI. If this signal remains active for more than 2s, the controller stops output and reports fault Err39 to prompt motor overheat. After this signal becomes inactive, Err39 is reset automatically and the system resumes to normal operation.

■ 68: Earthquake signal

If this signal remains active for more than 2s, the elevator enters the earthquake stop state, stops at the nearest landing floor and opens the door. Then the elevator starts running again after the earthquake signal becomes inactive.

■ 69: Back door forbidden signal

If double door machines are applied, this signal is used to prohibit the use of door machine 2.

■ 70: Light-load signal

It is used for nuisance judgment in the anti-nuisance function. If F8-08 Bit2 is set to 1, the system performs nuisance judgment by using the light-load switch. The load below 30% of the rated load is regarded as light load.

■ 71: Half-load signal

It is mainly used for judgment of the emergency running direction at power failure.

■ 72: Fire emergency floor switchover signal

The NICE3000^{new} supports two fire emergency floors. By default, the elevator stops at fire emergency floor 1 in fire emergency state. If this signal is active, the elevator stops at fire emergency floor 2 in fire emergency state.

■ 73: False floor signal

If the distance between two adjacent floors of the elevator in the actual shaft is too large so that the running time exceeds the minimum values set in F9-02 and FA-38, then the false floor signal is required. Otherwise, the system reports the fault E30.

■ 76: Door 1 open input

■ 77: Door 2 open input

■ 79: External fault input

External fault input is used to notify the controller of stop when other modules in the control cabinet such as the external braking unit are faulty.

■ 80: Terminal floor verification signal

The terminal floor signal is used with slow-down 1 to determine the terminal floor position when some terminal floors are short.

■ 81: Door lock 1 shorting

Door lock 1 shorting detection is used to detect door lock 1 shorting.

■ 82: Door lock 2 shorting

Door lock 2 shorting detection is used to detect door lock 2 shorting.

■ 86: Door lock bypass

Door lock bypass input signal. After the signal is active, the system enters the inspection state.

■ 88: Wire holder feedback signal input

The wire holder feedback signal input function code 88 is added for the MCB.

1) Under the automatic and inspection status, if the wire holder feedback signal is invalid, E67 is reported and the elevator stops immediately and cannot be started. Meanwhile, the UCMP fault detection is initiated. If unintended movement occurs, E65 is reported, which will cover E67.

2) To clear E67, press the resetting button RES/STOP on the hand-held manipulator, or set F-2 to 1 on the MCB keypad. If the wire holder feedback signal is valid for one second or longer, E67 is also cleared. After E67 is cleared, if the wire holder feedback signal is invalid again, E67 is reported.

Function Code	Name	Setting Range	Default	Unit	Property
F5-25	CTB input type	0 to 511	320	-	★

It is used to define the input signal type (NO/NC) of the CTB by binary bit.

For example, the input signal types of the CTB of an elevator are set as follows:

Bit	Parameter Name	Default	Bit	Parameter Name	Default
Bit0	Door 1 light curtain	0	Bit8	Light-load signal (digital)	1
Bit1	Door 2 light curtain	0	Bit9	Up leveling signal	1
Bit2	Door 1 open limit	0	Bit10	Down leveling signal	1
Bit3	Door 2 open limit	0	Bit11	Door machine overheat detection	0
Bit4	Door 1 close limit	0	Bit12	Door machine 1 safety edge	0
Bit5	Door 2 close limit	0	Bit13	Door machine 2 safety edge	0
Bit6	Full-load signal (digital)	1	Bit14	Reserved	-
Bit7	Overload signal (digital)	0	Bit15	Reserved	-
0: NC input 1: NO input					

Function Code	Name	Setting Range	Default	Unit	Property
F5-26	Y1 function selection	0 to 31	1	-	★
F5-27	Y2 function selection		2	-	★
F5-28	Y3 function selection		3	-	★
F5-29	Y4 function selection		4	-	★
F5-30	Y5 function selection		0	-	★
F5-31	Y6 function selection		0	-	★

These parameters are used to set signals output by relay output terminals Y1 to Y6.

- 00: Invalid

  The terminal has no function.

- 01: Running contactor control
- 02: Brake contactor control
- 03: Shorting door lock circuit contactor control

The terminal with one of these signals controls whether the contactor is opened or closed.

- 04: Fire emergency floor arrival signal feedback

In the fire emergency state, the system sends the feedback signal for monitoring after the elevator stops at the fire emergency floor.

- 05: Door machine 1 open
- 06: Door machine 1 close
- 07: Door machine 2 open
- 08: Door machine 2 close

The terminal with one of these signals is used to control open and close of door 1 or 2.

- 09: Brake and RUN contactors healthy

When the brake and RUN contactors operate properly (non-E36/E37 state), the system sends the feedback signal for monitoring.

- 10: Fault state

The terminal with the signal has output when the system is in the level-3, level-4 or level-5 fault state.

- 11: Running monitor

The terminal with the signal has output when the controller is running.

- 12: Shorting PMSM stator contactor

When the shorting PMSM stator contactor is applied in synchronous motor, the terminal with the signal is used to control whether the contactor is closed or opened.

- 13: Emergency evacuation automatic switchover

When detecting that the bus voltage declines to a certain value after power failure occurs on the mains supply, the controller outputs this signal and uses the battery for temporary power supply, implementing emergency evacuation running.

Only Y6/M6 can be allocated with this signal because the controller needs to depend on its residual power to drive the relay at power failure of the mains supply.

- 14: System healthy

The terminal with the signal has output when the system operates properly.

- 15: Emergency buzzer control

The terminal with the signal has output when the system is in the emergency evacuation running state. The buzzer tweets to prompt.

■ 16: Higher-voltage startup of brake

This signal is used for the brake that keeps the release state with voltage reduction. The terminal with this signal keeps the output for 4s to release the brake, and then the voltage is reduced to keep the brake release state.

■ 17: Elevator running in up direction

The terminal with the signal has output when the elevator runs in the up direction.

■ 18: Lamp/Fan running

It is used for the lamp/fan running output, the same as the energy saving control output of the CTB.

■ 19: Medical sterilization

It is used to control the output of the ultraviolet sterilizing lamp signal. After the elevator stops running and the lamp/fan stops operating, the medical sterilization output is started.

■ 20: Non-door zone stop

The terminal with this signal has output when the elevator stops at the non-door zone.

■ 21: Electric lock

It is used to control applying and releasing of the electric lock in the case of manual door.

■ 22: Non-service state

It is output when the elevator is in the non-service state and cannot respond to hall calls.

■ 23: Emergency evacuation completed

Output after emergency evacuation is completed. It is used to notify that ARD emergency evacuation is completed.

■ 25: Wire holder resetting

Wire holder resetting output conditions (meeting any of the following):

1) During power-on and starting for the first time, E65 (UCMP fault) and E41 (safety circuit fault) are not reported after 5-second delay (wire holder power-on time).

2) E67 is reported, but E65 (UCMP fault) is not reported. Under the inspection state, the safety circuit is disconnected (E41 safety circuit fault is reported) and then connected.

Wire holder resetting output requirements:

1) The wire holder resetting output signal is valid. Check whether the wire holder feedback signal is valid.

a) If the wire holder feedback signal is valid for one second or longer, clear E67. The status of the wire holder resetting output signal changes from valid to invalid, and the elevator works properly.

b) If the wire holder feedback signal is still invalid after 22 seconds (wire holder starting time), E67 persists. The status of the wire holder resetting output signal changes from valid to invalid, and elevator cannot be started.

2) When the wire holder resetting output signal is valid, the elevator doors cannot be opened or closed, and the elevator cannot be started. To enable this function, set Bit14 of F6-52. By default, this function is disabled.

■ 26: Braking pipe short circuit output

Output when the controller braking pipe is short-circuited.

■ 27: Alarm filter output

Alarm filtering output in non-inspection state during system running or door open limit.

Function Code	Name	Setting Range	Default	Unit	Property
F5-32	Communication status	CANbus and Modbus communication state monitoring	-	-	●

It is used to monitor the state of CANbus communication with the CTB and Modbus communication with the HCB.

When you enter the menu of F5-32, the LEDs on the operation panel indicate the current HCB communication state. The LEDs are numbered 5 to 1 from left to right to facilitate the description. The segments are defined as follows:

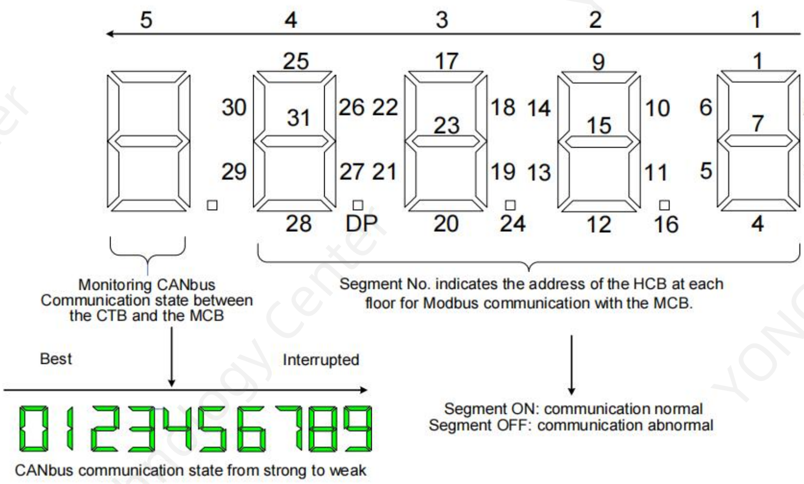


Figure 6-5 F5-32 communication state monitoring

Example Communication state displayed by the LEDs

For example, if the LEDs are shown as the following figure, it indicates that Modbus communication of addresses 1, 5, 6, 7, 12, 15, 16, 18, 19, 21, 22, 23, 25, 26 and 27 is abnormal, and Modbus communication of other addresses is normal. CANbus communication state displayed by the LED is 3, indicating a little interference with communication.

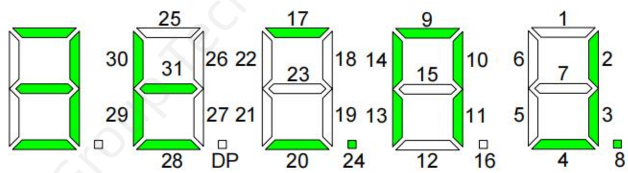


Figure 6-6 Example of LED display indicating the communication state

Function Code	Name	Setting Range	Default	Unit	Property
F5-33	F5-33 Program control selection	0 to 65535	0	-	★

F5-33 is used to select the elevator functions.

Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of F5-33 are described in the following table.

F5-33 Terminal program control			
Bit	Function	Description	Default
Bit3	Elevator fire emergency requirement for Hong Kong	If it is enabled, the fire emergency functions in F6-44 applying to Hong Kong become enabled automatically.	0
Bit4	Arrival gong disabled at night	The arrival gong is disabled from 22:00 p.m. to 7:00 a.m.	0
Bit6	Door lock disconnected at inspection switched over to normal running	The door lock is additionally disconnected once when the inspection state is switched over to the normal running state.	0
Bit7	Fault code not displayed on the keypad	The keypad does not blink to display the fault code.	0
Bit8	Door open command canceled immediately at door open limit	The system immediately cancels the door open command after receiving the door open limit.	0
Bit9	Car stop and zero-speed torque holding at abnormal brake feedback	When the brake feedback is abnormal, the elevator arrives at the door-zone position and stops. The door keeps closed, and the system holds torque output as long as possible. After the system is overloaded, there is no torque output, and the elevator may fall in this case. Be cautious of using this function.	0

Function Code	Name	Setting Range	Default	Unit	Property
F5-34	Terminal state display	Monitoring of I/O terminals on MCB	-	-	●
F5-35	Terminal state display	Monitoring of I/O terminals on CTB, CCB and HCB	-	-	●

These parameters are used to monitor the state of all I/O terminals of the system.

The segments of the five LEDs displayed are defined as follows.

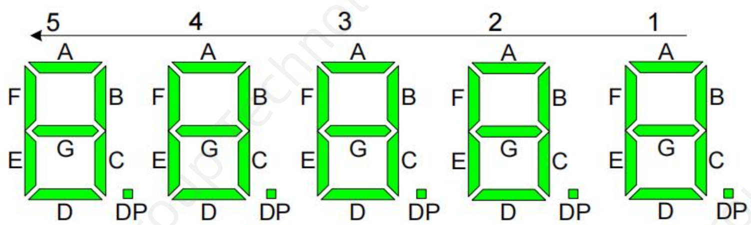


Figure 6-7 Monitoring of all I/O terminals

F5-34 Terminal state display					
	1	2	3	4	5
A	-	Inspection signal	Up slow-down 1 signal	Door machine 1 light curtain	Reserved
B	Up leveling signal	Inspection up signal	Down slow-down 1 signal	Door machine 2 light curtain	RUN contactor output
C	Down leveling signal	Inspection down signal	Up slow-down 2 signal	Brake contactor feedback 2	Brake contactor output
D	Door zone signal	Fire emergency signal	Down slow-down 2 signal	UPS input	Shorting door lock circuit contactor control
E	Safety circuit feedback 1	Up limit signal	Up slow-down 3 signal	Elevator lock input	Fire emergency floor arrival signal
F	Door lock circuit feedback 1	Down limit signal	Down slow-down 3 signal	Safety circuit feedback 2	-
G	RUN contactor feedback	Overload signal	Shorting door lock circuit contactor feedback	Shorting PMSM stator contactor feedback	-
DP	Brake contactor feedback 1	Full-load signal	Firefighter running signal	Door lock circuit feedback 2	-

F5-35 Terminal state display					
	1	2	3	4	5
A	Door 1 light curtain	Door open button	Door 1 open output	Door open button display	System light curtain state 1
B	Door 2 light curtain	Door close button	Door 1 close output	Door close button display	System light curtain state 2
C	Door 1 open limit	Door open delay button	Door lock signal	Door open delay button display	Hall call elevator lock input
D	Door 2 open limit	Direct travel ride signal	Door 2 open output	Non-door zone stop output	Hall call fire emergency input
E	Door 1 close limit	Attendant signal	Door 2 close output	Reserved	Full-load signal
F	Door 2 close limit	Direction change signal	Door lock signal	Buzzer output	Overload signal
G	Full-load signal	Independent running signal	Up arrival gong	Reserved	-
DP	Overload signal	Firefighter operation signal	Down arrival gong	Energy saving sign	-

Function Code	Name	Setting Range	Default	Unit	Property
F5-36	Load cell input selection	0 to 3	1	-	★

It is used to set the channel of setting the elevator load cell signal. When a load cell device is used, set this parameter correctly first.The values are as follows:

- 0: MCB digital input
- 1: CTB digital input
- 2: CTB analog input
- 3: MCB analog input

Function Code	Name	Setting Range	Default	Unit	Property
F5-37	X25 function selection	0: Invalid 4:Safety circuit signal 5: Door lock circuit signal 1 6: Door lock circuit signal 2 7: Door lock 1 shorting 8: Door lock 2 shorting	0	-	★
F5-38	X26 function selection		0	-	★
F5-39	X27 function selection		0	-	★
F5-40	X28 function selection		0	-	★

F5-37 to F5-40 are used to set signals input to heavy-current detection input terminals X25 to X28. The values are as follows:

- 0: Invalid
- 4: Safety circuit signal
- 5: Door lock circuit signal 1
- 6: Door lock circuit signal 2
- 7: Door lock 1 shorting
- 8: Door lock 2 shorting

Group F6: Basic elevator parameters

Function Code	Name	Setting Range	Default	Unit	Property
F6-00	Top floor of the elevator	F6-01 to 40	9	-	★
F6-01	Bottom floor of the elevator	1 to F6-00	1	-	★

These two parameters are used to set the top floor and bottom floor of the elevator, determined by the number of actually installed leveling plates.

Function Code	Name	Setting Range	Default	Unit	Property
F6-02	Parking floor	F6-01 to F6-00	1	-	★

When the idle time of the elevator exceeds the value set in F9-00, the elevator returns to the parking floor set in F6-02 automatically.

Function Code	Name	Setting Range	Default	Unit	Property
F6-03	Fire emergency floor	F6-01 to F6-00	1	-	★

When the elevator enters the state of returning to base floor at fire emergency, the elevator will return to this fire emergency floor.

Function Code	Name	Setting Range	Default	Unit	Property
F6-04	Elevator lock floor	F6-01 to F6-00	1	-	★

When the elevator enters the elevator lock state, the elevator will return to this elevator lock floor.

F6-04 is used to set the elevator lock floor. In the automatic running state, if the elevator lock switch is turned on or the set elevator lock time is reached, the elevator cancels all registered hall calls and responds to all registered car calls, returns to the elevator lock floor, stops automatic running, and closes the lamp and fan in the car; after the door closes, the elevator cancels hall call display.

Function Code	Name	Setting Range	Default	Unit	Property
F6-05	Service floors 1	0–65535 (floors 1–16)	65535	-	★
F6-06	Service floors 2	0–65535 (floors 17–32)	65535	-	★
F6-35	Service floors 3	0–65535 (floors 33–40)	65535	-	★

These parameters are used to set the service floors among floors 1–40.

F6-05 (Service floors 1) corresponds to floors 1–16. F6-06 (Service floors 2) corresponds to floors 17–32. F6-35 (Service floors 3) corresponds to floors 33–40.

The following part takes F6-05 as an example to describe how to set the service floors.

The 16 binary bits of the function code respectively correspond to 16 floors. If a bit is set to 1, the elevator will respond to calls of this floor; if this bit is set to 0, the elevator will not respond to calls of this floor.

Set every bit respectively. Convert the binary value to decimal and set it on the operation panel, as shown in the following figure.

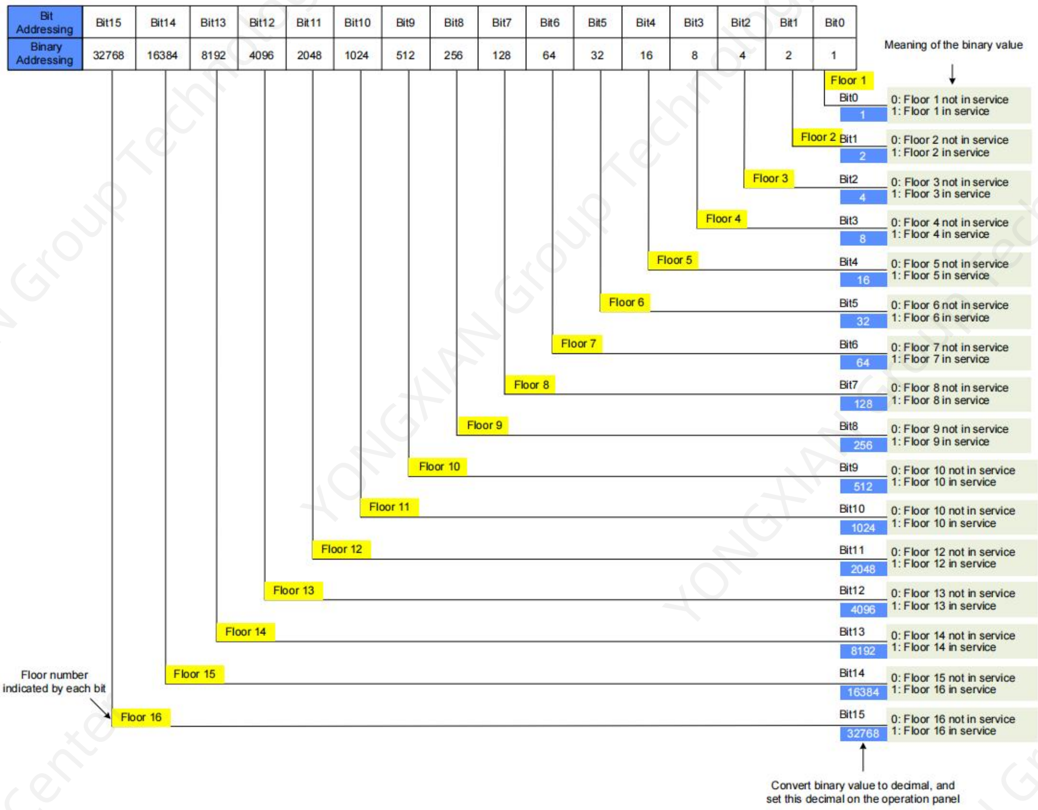
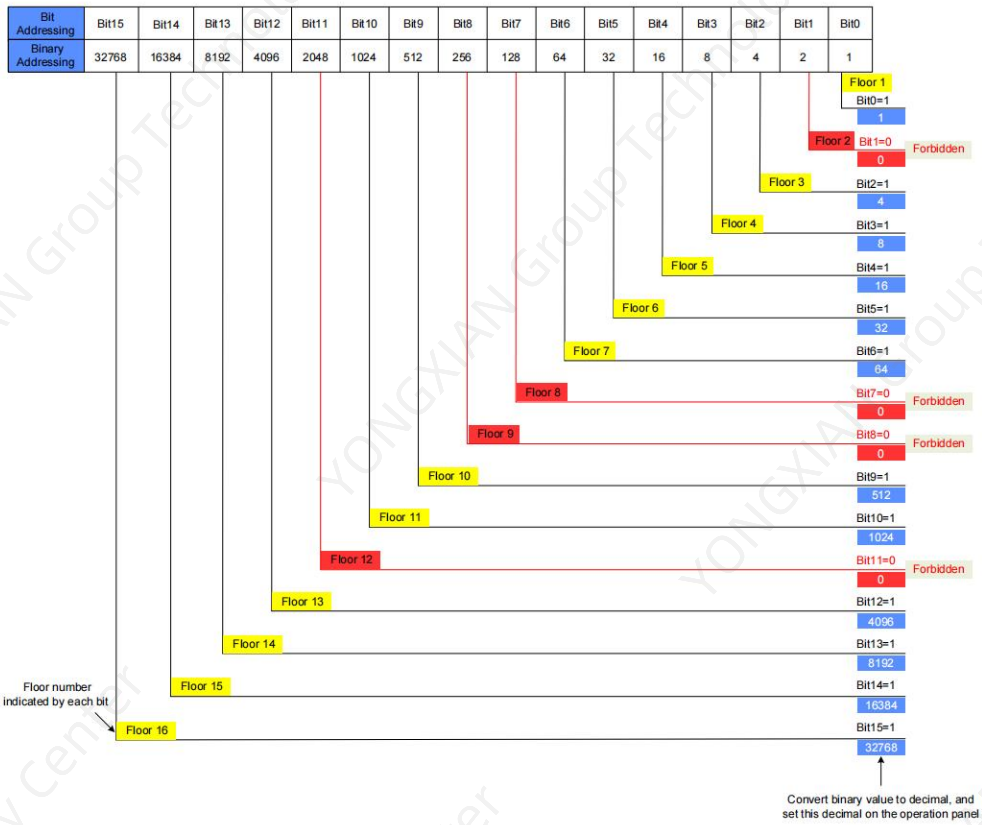


Figure 6-8 Converting binary value of F6-05 to decimal

Example

If floors 2, 8, 9, and 12 of a 16-floor elevator need to be forbidden, and all other floors are in service, we need to set Bit1, Bit7, Bit8, and Bit11 corresponding to floors 2, 8, 9, and 12 to 0, and set the other bits to 1, as shown in the following figure.



Convert the binary value to decimal:

1 + 4 + 8 + 16 + 32 + 64 + 512 + 1024 + 4096 + 8192 + 16384 + 32768 = 63101

Then, enter "63101" for F6-05 on the operation panel.

The setting method for F6-06 and F6-35 is the same as that for F6-05.

Function Code	Name	Setting Range	Default	Unit	Property
F6-07	Number of elevators in parallel/group mode	1 to 8	1	-	★
F6-08	Elevator No.	1 to 8	1	-	★
F6-09	Program control selection	Bit0: Dispersed waiting Bit2: Reserved Bit3: Parallel/Group control implemented at CAN2 Bit4: Group control in compatibility with NICE3000 Bit6: Clear floor number and display direction in advance Bit8: Unidirectional hall call (single hall call button) Bit9: Not detecting analog wire breaking Bit10: Err30 judgment at re-leveling cancellation Bit14: Time interval detection of safety circuit 2 and door lock circuit 2 (1.5s)	0	-	★

F6-07 and F6-08 are used to set the number of elevators and elevator No. in parallel/ group control mode.

Bit0 to Bit4 of F6-09 are used to set different parallel/group control modes. For details, see 9.14 Parallel/Group Control Scheme.

Function Code	Name	Setting Range	Default	Unit	Property
F6-10	Leveling switch filter time	10 to 50	14	ms	★

F6-10 indicates the delay time from the moment when the leveling switch acts to the moment when the leveling signal becomes active. You need not modify it.

Function Code	Name	Setting Range	Default	Unit	Property
F6-11	Elevator function selection 2	0 to 65535	8448	-	★

F6-11 is used to select the elevator functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of F6-11 are described in the following table.

F6-11 Elevator function selection			
Bit	Function	Description	Default
Bit1	Disabling returning to base floor for verification	The function of returning to base floor for verification due to large deviation of the car position is disabled.	0
Bit2	Canceling auto sequential arrange of hall call floor addresses to be displayed	If the display of a floor in group FE is set to 1, the following floors to be displayed are automatically arranged in the ascending order. This bit is used to cancel this function.	0
Bit5	Current detection valid at startup for synchronous motor	The controller performs output current detection when the synchronous motor is started up. If the current is abnormal, the output will be locked and the running will be forbidden.	0
Bit6	Reversing MCB lamp output	After this function is enabled, the MCB lamp output logic is reversed.	0
Bit7	Door open valid at non-door zone in the inspection state	In the inspection state, you can open/close the door by pressing the door open/close button at the non-door zone.	0
Bit8	Door open and close once after inspection turned to normal	The elevator door opens and closes once after the system turns from first-time inspection to normal running.	1
Bit10	Buzzer not tweet upon re-leveling	The buzzer inside the car does not tweet upon re-leveling.	0
Bit11	Super short floor function	The controller cannot perform shaft-tuning if the floor height is less than 500 mm. After this function is enabled, shaft-tuning can be performed normally.	0
Bit12	Automatic reset of faults	The controller automatically resets the faults once every hour.	0
Bit13	E53 fault auto reset	When E53 is reported, if the conditions of door open limit valid and door lock release are satisfied, the controller resets E53 automatically. A maximum of three times of auto reset is allowed.	1
Bit14	Up slow-down not reset for super short floor	If this function is enabled, the up slow-down 1 signal does not reset floor display. The down slow-down 1 signal still resets floor display. This is valid only when the customized super short floor function is enabled.	0

F6-11 Elevator function selection			
Bit15	Down slow-down not reset for super short floor	If this function is enabled, the down slow-down 1 signal does not reset floor display. The up slow-down 1 signal still resets floor display. This is valid only when the customized super short floor function is enabled.	0

Function Code	Name	Setting Range	Default	Unit	Property
F6-12	VIP floor	0 to F6-00	0	-	★

F6-12 is used to set the VIP floor. See 9.9 VIP Running Function.

Function Code	Name	Setting Range	Default	Unit	Property
F6-13	Security floor	0 to F6-00	0	-	★

F6-13 is used to set the security floor of the elevator.

If the security signal is active or it is during the night security period, the elevator runs to the security floor first every time, opens and closes the door once, and then runs to the destination floor.

The elevator can be made to stop at the security floor in the following two ways:

Fd-07/08 is set to 5 (Security signal). If the security signal is active, the elevator enters the security state.

The night security floor function is enabled (FE-32 Bit5 = 2), the elevator enters the security state from 22:00 p.m. to 6:00 a.m.

Function Code	Name	Setting Range	Default	Unit	Property
F6-14	Start time of down collective selective 1	00.00 to 23.59	00.00	HH.MM	☆
F6-15	End time of down collective selective 1	00.00 to 23.59	00.00	HH.MM	☆
F6-16	Start time of down collective selective 2	00.00 to 23.59	00.00	HH.MM	☆
F6-17	End time of down collective selective 2	00.00 to 23.59	00.00	HH.MM	☆

F6-14 to F6-17 define the time periods of down collective selective 1 and down collective selective 2, during which, the elevator responds to only downward hall calls.

NOTE

◆ To enable the down collective selective peak service, set FE-32 Bit6 to 1.

Function Code	Name	Setting Range	Default	Unit	Property
F6-18	Start time of time-based floor service 1	00.00 to 23.59	00.00	HH.MM	☆
F6-19	End time of time-based floor service 1	00.00 to 23.59	00.00	HH.MM	☆
F6-20	Service floor 1 of time-based floor service 1	0 to 65535	65535	-	☆
F6-21	Service floor 2 of time-based floor service 1	0 to 65535	65535	-	☆
F6-36	Service floor 3 of time-based floor service 1	0 to 65535	65535	-	☆
F6-22	Start time of time-based floor service 2	00.00 to 23.59	00.00	HH.MM	☆
F6-23	End time of time-based floor service 2	00.00 to 23.59	00.00	HH.MM	☆
F6-24	Service floor 1 of time-based floor service 2	0 to 65535	65535	-	☆
F6-25	Service floor 2 of time-based floor service 2	0 to 65535	65535	-	☆
F6-37	Service floor 3 of time-based floor service 2	0 to 65535	65535	-	☆

F6-18 to F6-25 set the time range and service floors of two groups of time-based floor services.

Service floor 1 corresponds to floors 1–16, service floor 2 corresponds to floors 17–32, and service floor 3 corresponds to floors 33–40. For example, in the time period of time-based floor service 1 (set by F6-18 and F6-19), the elevator responds to the service floors set by F6-20, F6-21, and F6-36 but ignores the service floors set by F6-05, F6-06, and F6-35. The setting of time-based service floors is the same as that of service floors in F6-05.

NOTE

◆ To enable the time-based floor service, set FE-32 Bit8 to 1. Then, you can set the time range and service floors of two groups of time-based floor services.

Function Code	Name	Setting Range	Default	Unit	Property
F6-26	Peak 1 start time for parallel/group control	00.00 to 23.59	00.00	HH.MM	☆
F6-27	Peak 1 end time for parallel/group control	00.00 to 23.59	00.00	HH.MM	☆
F6-28	Parallel/group control peak 1 floor	F6-01 to F6-00	1	-	★
F6-29	Peak 2 start time for parallel/group control	00.00 to 23.59	00.00	HH.MM	☆
F6-30	Peak 2 end time for parallel/group control	00.00 to 23.59	00.00	HH.MM	☆
F6-31	Parallel/group control peak 2 floor	F6-01 to F6-00	1	-	★

F6-26 to F6-28 are used to set peak service time period 1 and corresponding service floors.

F6-29 to F6-31 are used to set peak service time period 2 and corresponding service floors.

During a peak time period, if there are more than three car calls from the peak floor, the elevator enters the peak service state. At the moment, the car calls from the peak floor are valid all the time. The elevator returns to this floor if it is idle.

NOTE

◆ To enable the parallel/group control peak service, set FE-32 Bit7 to 1. To disable the parallel/group control peak service, set FE-32 Bit7 to 0.

Function Code	Name	Setting Range	Default	Unit	Property
F6-38	Elevator lock start time	00.00 to 23.59	00.00	HH.MM	☆
F6-39	Elevator lock end time	00.00 to 23.59	00.00	HH.MM	☆

F6-38 and F6-39 are used to set the elevator lock time period, during which the elevator is in locked state, having the same effect as the elevator lock switch.

NOTE

The elevator can switch to the locked state in the following two ways:

◆ F6-40 Bit5 = 1, to enable the timed elevator lock function.

◆ F6-38 and F6-39 are used to set the elevator lock time period, during which the elevator is in locked state.

◆ Fd-07 = 1, to enable the hall elevator lock switch.

Function Code	Name	Setting Range	Default	Unit	Property
F6-40	Program control selection 1	0 to 65535	0	-	★
F6-41	Program control selection 2	0 to 65535	0	-	★
F6-42	Program control selection 3	0 to 65535	0	-	★

These parameters are used to select program control functions. Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of these parameters are described in the following table.

F6-40 Program control selection 1			
Bit	Function	Description	Default
Bit0	Disability function	It is used to enable or disable the disability function.	0

F6-40 Program control selection 1			
Bit	Function	Description	Default
Bit1	Soft limit function	When the up slow-down and down leveling signals are active and the up leveling signal is inactive, the system considers that the up limit is performed. It is the same for the down limit signal.	0
Bit2	JP16 input used as back door selection (button)	JP16 is used for the input of the back door open signal. This function is enabled if FC-04 is set to 2. When JP16 has input, the elevator opens only the back door. When IP16 has no input, the elevator opens only the front door.	0
Bit3	JP16 input used as the back door open signal	JP16 is used for the input of the back door open signal.	0
Bit4	Opening only one door of opposite doors under manual control	This function is enabled only in the opposite door control modes 3 and 4. In this case, only one door opens each time while the other door must stay in the door close limit state. In group Fd, the extended input includes "Single/ Double door selection". If this input is active in the opposite door control mode 3, both doors open if there is a car call.	0
Bit5	Timed elevator lock	F6-38/F6-39 is valid only when this function is enabled.	0
Bit6	Manual door	This function is used for the elevator with manual door.	0
Bit7	Reserved	-	-
Bit8	Reserved	-	-
Bit9	Disabling reverse floor number clear	The system clears all the current car calls every time the elevator changes the direction by default. When this function is enabled, the function of clearing reverse floor numbers is disabled.	0
Bit10	Displaying next arriving floor number	The next floor to be arrived at is displayed during elevator running.	0
Bit11	Responding to car calls first	The system responds to hall calls only after executing all car calls.	0
Bit12	Car call assisted command in single door used as disability function	You can set the auxiliary command terminal (CN8) on the CTB for input of the disability calls. 0: Consistent with CN7 for the single door, and back door for the double door 1: CN8 calls are the disability calls	0
Bit13	Folding command used as disability function and back door function	It is valid only when the function of Bit14 is enabled. 1: Disability 0: Back door	0

F6-40 Program control selection 1			
Bit	Function	Description	Default
Bit14	Car call command folding	Car call command folding: A. Function disabled: CN7 is used for front door calls or ordinary calls, and CN8 is used for back door calls or disability calls. B. Function enabled: For CN7 and CN8, inputs 1 to 16 are used for front door calls or ordinary calls, and inputs 17 to 32 are used for back door calls or disability calls.	0
Bit15	JP20 used for switchover to back door (switch)	JP20 is used for input of switchover between the front door and the back door.	0

F6-41 Program control selection 2			
Bit	Function	Description	Default
Bit0	Reserved	-	-
Bit1	Reserved	-	-
Bit2	Inspection to stop due to slow-down 1	During inspection running, if the slow-down 1 acts, the system decelerates to stop.	0
Bit3	Reserved	-	-
Bit4	Buzzer tweet during door open delay	The buzzer will tweet when the door open delay time set in Fb-14 is reached.	0
Bit5	Reserved	-	-
Bit6	Canceling door open delay	Door open delay is canceled when the door open delay button is pressed again.	0
Bit7	Reserved	-	-
Bit8	Elevator lock at door open	In the elevator lock state, the elevator keeps the door open at the elevator lock floor.	0
Bit9	Display available at elevator lock	In the elevator lock state, hall calls are displayed normally.	0
Bit10	Elevator lock in the attendant state	The elevator is locked properly in the attendant state.	0
Bit11	Blinking at arrival	The car display blinks when the elevator arrives at a floor. The blinking advance time is set in F6-47.	0
Bit12	Door re-open during door open delay	The door re-opens if the door open delay input is active during door close.	0
Bit13	Door re-open after car call of the present floor	The door re-opens if the car call of the present floor is valid during door close.	0

F6-42 Program control selection 3			
Bit	Function	Description	Default
Bit0	Reserved	-	-
Bit1	Canceling door open/close command at delay after door open/ close limit	Bit1 = 1: The door open/close command is canceled at the delay of 1s after door open/close limit.	0
Bit2	Not judging door lock state at door close output	On normal conditions, the system determines that the door is completely closed only when the door close limit signal is active and the door lock is applied. If this function is enabled, the system need not judge the door lock state.	0
Bit3	Door close command output during running	The door close command is output continuously during the elevator running.	0
Bit4	Returning to base floor for verification at first-time power-on	The elevator runs to the bottom floor for verification at power-on for the first time.	0
Bit5	Clearing calls immediately at elevator lock	0: After the elevator lock signal becomes active, the elevator clears hall calls and responds to the current car call, and then enters elevator lock state. 1: After the elevator lock signal becomes active, the elevator clears all calls and enters elevator lock state.	0
Bit6	Electric lock NC output	After the NC output is selected, the electric lock signal is not output during door open and is output during door close.	0
Bit7	Canceling fault E50 detection	When Bit7 is set to 1, fault E50 is not detected.	0
Bit8	Door open/close limit detection cancellation	When this function is enabled, the fault detection of the door open/close limit signal is canceled.	0
Bit9	Fault subcode scrolling display cancellation	When this function is enabled, the keypad will not display the fault in a scrollable manner.	0
Bit10	Door open energy saving	In the case of waiting with the door open, the system closes the lighting and fan after the time set in F9-01 passes by in door open limit state.	0
Bit11	Independent switch separated from parallel connection	When this function is enabled, individual elevators will be independent and separated from parallel control and be in normal running mode. When this function is disabled, the elevator will be independent and separated from parallel control and enter the VIP running mode.	1

Function Code	Name	Setting Range	Default	Unit	Property
F6-43	Attendant function selection	0 to 65535	128	-	★

F6-43 is used to select the attendant-related elevator functions. Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. You can view and set this function code using the bits.

The functions defined by the binary bits of F6-43 are described in the following table.

F6-43 Attendant function selection			
Bit	Function	Description	Default
Bit0	Calls canceled after entering attendant state	All calls are canceled after the elevator enters attendant state for the first time.	0
Bit1	Not responding to hall calls	The car blinks inside, prompting there is a hall call, but the system does not respond.	0
Bit2	Attendant/ Automatic switchover	If this function is enabled, the setting of F5-00 is valid	0
Bit3	Door close at jogging	The elevator door closes after the attendant presses the door close button manually.	0
Bit4	Automatic door close	It is the same as the normal state. After the door open holding time is reached, the door closes automatically.	0
Bit5	Buzzer tweeting at intervals in attendant state	When there is a registered hall call, the buzzer tweets 2.5s at intervals.	0
Bit6	Continuous buzzer tweeting in attendant state	When there is a registered hall call, the buzzer tweets continuously until there is a registered car call at a hall call floor.	0
Bit7	Car call button blinking to prompt	When the hall call input is active, the car call button for the corresponding floor blinks to give a prompt.	1

Function Code	Name	Setting Range	Default	Unit	Property
F6-44	Fire emergency function selection	0 to 65535	16456	-	★

F6-44 is used to select the fire emergency-related functions. Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of F6-43 are described in the following table.

F6-44 Fire emergency function selection			
Bit	Function	Description	Default
Bit0 to Bit2	Reserved	-	-
Bit3	Arrival gong output in inspection or fire emergency state	The arrival gong is output in the inspection or fire emergency state.	1
Bit4	Multiple car calls registered in fire emergency state	Multiple car calls can be registered in the fire emergency state. If this function is disabled, only one car call can be registered.	0
Bit5	Retentive at power failure in fire emergency state	In the fire emergency state, the current system and car state will be memorized at power failure and be resumed after the system is powered on again.	0
Bit6	Closing door by holding down the door close button	In the fire emergency state, the door close process can be completed only by holding down the door close button until the door close limit is reached. Otherwise, it will be switched over to door open automatically.	1
Bit7	Reserved	-	-
Bit8	Door close at car call registering	The elevator enters the door close process automatically if a car call is registered.	0
Bit9	Displaying hall calls in fire emergency state	Hall calls are displayed in the fire emergency state.	0
Bit10	Firefighter forced running	JP22 is used for firefighter forced running input. In the firefighter running state, when the JP22 input switch and the door close button are enabled simultaneously, the buzzer tweets and the system outputs the door close signal. If the door lock is not enabled within 10s, the system outputs the shorting door lock circuit contactor signal, and the elevator starts running (used together with SCB-A).	0
Bit11	Exiting firefighter state upon arrival at fire emergency floor	The system can exit the firefighter state only after the elevator arrives at the fire emergency floor.	0
Bit12	Not clearing car calls at reverse door open in firefighter running state	In the firefighter running state, the car calls that have been registered are not cleared at reverse door open.	0
Bit13	Reserved	-	-
Bit14	Opening door by holding down the door open button	In the fire emergency state, the door open process can be completed only by holding down the door open button until the door open limit is reached. Otherwise, it will be switched over to door close automatically.	1
Bit15	Automatic door open at fire emergency floor	The door opens automatically after the elevator arrives at the fire emergency floor.	0

Function Code	Name	Setting Range	Default	Unit	Property
F6-45	Emergency evacuation function selection	0 to 65535	0	-	★

F6-45 is used to select the emergency evacuation-related elevator functions. Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

When F6-45 Bit2 = 1, the elevator stops at the emergency evacuation parking floor set in F6-49.

When F6-45 Bit2 = 0, the elevator stops at the nearest landing floor.

The functions defined by the binary bits of F6-45 are described in the following table.

<table>
<tr><th colspan="9">F6-45 Emergency evacuation function selection</th></tr>
<tr><th>Bit</th><th>Function</th><th colspan="6">Description</th><th>Default</th></tr>
<tr><td>Bit0</td><td rowspan="2">Direction determine mode</td><td>0</td><td rowspan="2">Automatically calculating the direction (The elevator runs in heavy-load direction. The no-load-cell function must be enabled.)</td><td>0</td><td rowspan="2">Direction of nearest landing floor</td><td>1</td><td rowspan="2">Load direction determining (The elevator runs in heavy-load direction. The load-cell function must be enabled.)</td><td>0</td></tr>
<tr><td>Bit1</td><td>0</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>Bit2</td><td>Stop at the base floor</td><td colspan="6">During evacuation running, the elevator arrives at the evacuation parking floor set in F6-49 (it must be a non-zero value and is a service floor). Otherwise, the elevator stops at the nearest floor.</td><td>0</td></tr>
<tr><td>Bit3</td><td>Single leveling door open</td><td colspan="6">During evacuation running, the elevator arrives at the destination floor. When a leveling signal is active, the elevator decelerates to stop.</td><td>0</td></tr>
<tr><td>Bit4</td><td>Startup compensation</td><td colspan="6">Startup torque compensation valid in emergency evacuation running</td><td>0</td></tr>
<tr><td>Bit5 to Bit7</td><td>Reserved</td><td colspan="6">-</td><td>0</td></tr>
<tr><td>Bit8</td><td>Emergency evacuation running time protection</td><td colspan="6">If the elevator does not arrive at the required floor after 50s emergency evacuation running time, E33 is reported. This function is invalid when the function of switching over shorting stator braking mode to controller drive is used.</td><td>0</td></tr>
<tr><td>Bit9</td><td>Reserved</td><td colspan="6">-</td><td>0</td></tr>
<tr><td>Bit10</td><td>Emergency buzzer output</td><td colspan="6">The buzzer output is active during UPS emergency evacuation running.</td><td>0</td></tr>
<tr><td>Bit11</td><td>Reserved</td><td colspan="6">-</td><td>0</td></tr>
<tr><td>Bit12</td><td>Shorting stator braking mode switched over to controller drive</td><td colspan="6">If the speed is still lower than the value set in F6-48 after the elevator is in shorting stator braking mode for 10s, the shorting stator braking mode is switched over to controller drive.</td><td>0</td></tr>
</table>

F6-45 Emergency evacuation function selection				
Bit	Function	Description		Default
Bit14	Emergency evacuation exit mode	0	The system exits emergency evacuation when receiving the door open limit signal from the elevator that arrives at the destination floor.	0
		1	The system exits emergency evacuation when receiving the door close limit signal from the elevator that arrives at the destination floor.	
Bit15	Shorting stator braking function	When this function is enabled, the setting of related function codes becomes effective.		0

For details on the emergency evacuation function, see 9.13 Automatic Emergency Evacuation Scheme at Power Failure.

Function Code	Name	Setting Range	Default	Unit	Property
F6-46	VIP function selection	0 to 65535	0	-	★

F6-46 is used to select the elevator VIP function. Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of F6-46 are described in the following table.

VIP function selection			
Bit	Function	Description	Default
Bit0	VIP enabled by hall call at VIP floor	After this function is enabled, the system enters VIP running.	0
Bit1	VIP enabled by terminal	After the terminal for VIP hall call becomes ON, the system enters VIP running.	0
Bit2 to Bit7	Reserved	-	-
Bit8	Number of VIP car calls limited	If this function is enabled, only one car call can be selected simultaneously in the VIP state.	0

For detailed descriptions on the VIP function, see 9.9 VIP Running Function.

Function Code	Name	Setting Range	Default	Unit	Property
F6-47	Blinking advance time	0.0 to 15.0	1.0	s	☆

F6-47 is used to set the blinking advance time when the elevator arrives at the floor required by the car call.

Function Code	Name	Setting Range	Default	Unit	Property
F6-48	Emergency evacuation switching speed	0.010 to 0.630	0.010	m/s	★

F6-48 is used to set the switching speed at shorting stator braking mode switched over to controller drive via speed setting.

Function Code	Name	Setting Range	Default	Unit	Property
F6-49	Evacuation parking floor	0 to F6-00	0	s	★

When F6-45 Bit2 = 1, the elevator stops at the emergency evacuation parking floor set in F6-49.

Function Code	Name	Setting Range	Default	Unit	Property
F6-50	Parallel floor offset	0 to 40	0	-	★

F6-50 is used when the bottom floors of two elevators in parallel control are inconsistent. Direct parallel control can be implemented by setting this parameter, without the necessity of readjusting the top and bottom floors and repeating shaft auto-tuning.

Function Code	Name	Setting Range	Default	Unit	Property
F6-51	Static current	0.00 to 655.00	0	A	★

F6-51 is used to set static current during the certification of static elements.

Function Code	Name	Setting Range	Default	Unit	Property
F6-52	Program function selection	0 to 65535	0	-	★

F6-52 is program function selection. Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of these parameters are described in the following table.

F6-52 Program function selection			
Bit	Function	Description	Default
Bit2	Bit2: CAN communication AFE support	It is used to enable the AFE communication function.	0
Bit6	CAN communication leveling signal	It is used to enable the transmission of up leveling and down leveling signals via CTB CAN communication.	0
Bit7	Door machine overheat detection	It is used to enable the door machine overheat detection function.	0

Group F7: Test function parameters

The parameters in this group are provided to facilitate elevator commissioning.

Before the elevator running test at normal speed is performed, check that the shaft is unimpeded and the parameters have been set. Let the elevator run to the middle floor of the entire travel to prevent any elevator running direction error. Run the single-floor call and enter the multi-floor call to perform commissioning. After commissioning is completed, check whether the parameters in this group are set correctly.

Function Code	Name	Setting Range	Default	Unit	Property
F7-00	Car call floor registered	0 to F6-00	0	-	☆
F7-01	Up call floor registered	0 to F6-00	0	-	☆
F7-02	Down call floor registered	0 to F6-00	0	-	☆

These parameters are used to set the destination floors at elevator commissioning or repairing. They can be respectively used as the car call button, hall call up button and hall call down button. After the test parameters are set, the calls remain valid, and will become invalid after they are changed to 0 or the system is powered off completed.

Function Code	Name	Setting Range	Default	Unit	Property
F7-03	Random running times	0 to 60000	0	-	☆

F7-03 is used to set the random running times of the system.

The NICE3000^{new} has the random automatic running function. If the setting of F7-03 is greater than 60000, the system keeps implementing random automatic running until you set F7-03 to 0. You can set the time interval between two times of random running in F7-08.

Function Code	Name	Setting Range	Default	Unit	Property
F7-04	Hall call enabled	0: No 1: Yes	0	-	☆

F7-04 is used to forbid the hall calls. The values are as follows:

■ 0: No (hall call allowed)

■ 1: Yes (hall call forbidden)

Function Code	Name	Setting Range	Default	Unit	Property
F7-05	Door open enabled	0: No 1: Yes	0	-	☆

F7-05 is used to forbid door open. The values are as follows:

■ 0: No (door open allowed)

■ 1: Yes (door open forbidden)

NOTE

◆ Note that continuous running of the elevator without opening the door accelerates overheating of the controller module. Long-time use in such mode may cause overheat protection, and therefore, use the function with caution.

Function Code	Name	Setting Range	Default	Unit	Property
F7-06	Overload function	0: Disabled 1: Enabled	0	-	☆

F7-06 is used to set the overload function. The values are as follows:

- 0: Disabled (overload forbidden)
- 1: Enabled (overload allowed)

NOTE

◆ Note that overload is allowed (F7-06 = 1) only in the heavy-load test. Once the test is complete, forbid overload running immediately.

Function Code	Name	Setting Range	Default	Unit	Property
F7-07	Limit function	0: Enabled 1: Disabled	0	-	☆

F7-07 is used to forbid limit switches. The values are as follows:

- 0: No (Limit switch enabled)
- 1: Yes (Limit switch disabled)

NOTE

◆ The limit switch is disabled (F7-07 = 1) only in the test of the final limit switch. Use the function with caution.

Function Code	Name	Setting Range	Default	Unit	Property
F7-08	Time interval of random running	0 to 1000	0	s	☆

F7-08 is used to set the time interval between two times of random running.

Function Code	Name	Setting Range	Default	Unit	Property
F7-09	Braking force test result	0: Insignificant 1: Pass 2: Fail	0	-	●
F7-10	Countdown for braking force detection period	0 to 1440	1440	min	★

F7-09 indicates braking force test results performed by the system.

- 0: It indicates that the system has not performed any braking force test.
- 1: It indicates that braking force test passes.
- 2: It indicates that braking force test fails and the system reports the fault E66. The brake must be inspected after any fault and can be reset only after the braking force test passes.

F7-10 is countdown for braking force detection period.

The initial value is 1440 minutes, i.e. 24 h. The test is automatically triggered if the system has no call after 12 h so that the stop time exceeds the energy saving time. When it is smaller than 10 minutes ahead of 24 h, the system clears car calls without any response to hall calls. After the door is automatically closed and the elevator buzzes for 30s, the system forcedly starts a braking force test.

Group F8: Enhanced function parameters

Function Code	Name	Setting Range	Default	Unit	Property
F8-00	Load for load cell auto-tuning	0 to 100	0	%	★

To perform load cell auto-tuning, do as follows:

Step 1: Ensure that F8-01 is set to 0 and F5-36 (Load cell input selection) is set to 2 (CTB analog input) or 3 (MCB analog input) to make the system allow load cell auto tuning.

Step 2: Stop the elevator at any floor, with the car in the no-load state. Set F8-00 to 0 and press ENTER .

Step 3: Put N% load in the car. Then set F8-00 to N and press ENTER . For example, if you put 500 kg load in the elevator with rated load of 1000 kg, set F8-00 to 50.

After the load-cell auto-tuning is completed, the corresponding no-load and full-load data will be recorded in F8-06 and F8-07. You can also manually input the data according to the actual situation.

Function Code	Name	Setting Range	Default	Unit	Property
F8-01	Pre-torque selection	0 to 3	2	-	★
F8-02	Pre-torque offset	0.0 to 100.0	50.0	%	★

F8-01 is used to set the pre-torque compensation mode at startup of the elevator. The values are as follows:

- 0: Pre-torque invalid
  Load cell auto-tuning is allowed.
- 1: Load cell pre-torque compensation
  With a load cell, the system implements the pre-torque compensation function.
- 2: Automatic pre-torque compensation
  The system automatically adjusts the compensated torque at startup without a load cell.
- 3: Both load cell pre-torque compensation and automatic pre-torque compensation valid
  When automatically adjusting the startup compensation torque, the system make a correction together with the load cell to achieve better startup effects on some occasions. If F8-01 is set to 1, the system outputs the torque matching the load in advance to ensure the riding comfort at startup. The output torque is limited by F2-08 (Torque upper limit). When the load torque is greater than the set torque upper limit, the output torque of the system is the torque upper limit.

F8-02 is used to set the pre-torque offset.

It is actually the balance coefficient of the elevator, indicating the percentage of the car load to the rated load when the counterweight and the car weight are balanced.

Function Code	Name	Setting Range	Default	Unit	Property
F8-03	Drive gain	0.00 to 2.00	0.60	-	★
F8-04	Brake gain	0.00 to 2.00	0.60	-	★

These two parameters are used to set the pre-torque gain when the elevator runs on the drive side or the brake side.

For details, see 5.6 Riding Comfort Adjustment.

Function Code	Name	Setting Range	Default	Unit	Property
F8-05	Current car load	0 to 255	0	-	●

F8-05 is readable and reflects the load condition in the car. The value is sampled by the NICE3000^{new} by using a load cell to judge overload or full-load, or calculate the torque current for load cell pre-torque compensation.

Function Code	Name	Setting Range	Default	Unit	Property
F8-06	Car no-load load	0 to 255	0	-	★
F8-07	Car full-load load	0 to 255	0	-	★

F8-06 and F8-07 respectively records the car no-load and full-load conditions in the car. They are AD sampling values.

Function Code	Name	Setting Range	Default	Unit	Property
F8-08	Anti-nuisance function	0: Anti-nuisance function disabled 1: Nuisance judged by load cell 2: Nuisance judged by light curtain 4: Nuisance judged by light-load signal	0	-	☆

It is the criteria for judging whether nuisance exists. The values are as follows:

- 0: Anti-nuisance function disabled
- 1: Nuisance judged by load cell
  A load cell is required. The system judges whether nuisance exists by comparing the load cell data and the number of car calls.
- 2: Nuisance judged by light curtain
  The system determines that nuisance exists when the light curtain does not act after the elevator stops at arrival for three consecutive times.
- 4: Nuisance judged by light-load signal
  If the light-load signal is active, the system determines that nuisance exists when the number of car calls is greater than a certain value.
- When the system determines that the elevator is in the nuisance state, it cancels all car calls. In this case, call calls need to be registered again.

Function Code	Name	Setting Range	Default	Unit	Property
F8-09	Emergency evacuation operation speed at power failure	0.020 to F3-11	0.050	m/s	★
F8-10	Emergency evacuation operation mode at power failure	0 to 2	1	-	★

F8-09 is used to set the speed for emergency evacuation operation at power failure.

F8-10 is used to set the emergency evacuation operation mode at power failure.

The values are as follows:

- 0: Motor not running
- 1: UPS
- 2: 48 V battery power supply

See 9.13 Automatic Emergency Evacuation Scheme at Power Failure.

Function Code	Name	Setting Range	Default	Unit	Property
F8-11	Brake release delay	0.200 to 1.500	0.600	s	★

This parameter is used to set the time during which the system retains the zero-speed torque current output.

Function Code	Name	Setting Range	Default	Unit	Property
F8-12	Fire emergency floor 2	0 to F6-00	0	-	★

This parameter is used to set fire emergency floor 2. After the fire emergency floor switchover signal set on the MCB is active, the elevator enters the fire emergency running state and returns to the fire emergency floor.

Function Code	Name	Setting Range	Default	Unit	Property
F8-14	HCB communication setting	Bit0: HCB communication baud rate Bit4: Energy saving of HCB communication Bit9: Faint light control of HCB buttons	0	-	☆
F8-15	CAN Communication setting	Bit10: Door open/close button not controlled by the IC card	0	-	☆
F8-16	Start address of hall call auxiliary command	0 to 40	0	-	★
F8-17	Hall call address check	0 to 1	0	-	★

F8-14 Bit0 = 0: The communication baud rate between the MCB and HCB is 9600 bps.

F8-14 Bit0 = 1: The communication baud rate between the MCB and HCB is 38400 bps. Note that only the NICE3000new product supports 38400 bps, and the NICE3000 supports only 9600 bps.

The system automatically determines the communication baud rate, and generally, you need not set this parameter.

F8-16 is used to set the HCB start address of the back door in opposite door mode. HCB address of back door = HCB address of front door at the same floor + F8-16

If F8-17 is set to 1, the HCB no longer displays the current floor information of the car but displays the set address of itself, convenient for inspection in the case of wrong floor address setting. This function is valid only when the communication baud rate is 38400 bps.

Group F9: Time parameters

Function Code	Name	Setting Range	Default	Unit	Property
F9-00	Idle time before returning to base floor	0 to 240	10	min	☆

It is used to set the idle time of the elevator before returning to the base floor.

When the idle time of the elevator exceeds the setting of this parameter, the elevator returns to the base floor.

Function Code	Name	Setting Range	Default	Unit	Property
F9-01	Car energy-saving time	0 to 240	2	min	☆

It is used to set the time that fan and lamp stays ON before being turned off automatically.

If there is no running command in the automatic running state, the system turns off the fan and lamp automatically after the time set in this parameter.

Function Code	Name	Setting Range	Default	Unit	Property
F9-02	Motor running time limit	0 to 45	45	s	★

It is used to set the running time limit of the motor.

In normal running state, if the continuous motor running time in the same direction between two adjacent floors exceeds the setting of this parameter but no leveling signal is received, the system will perform protection. This parameter is mainly used for over-time protection in the case of steel rope slipping on the traction sheave.

If this parameter is set to a value smaller than 3s, it becomes invalid.

Function Code	Name	Setting Range	Default	Unit	Property
F9-03	Clock: year	2000 to 2100	Current time	YYYY	☆
F9-04	Clock: month	01 to 12	Current time	MM	☆
F9-05	Clock: day	1 to 31	Current time	DD	☆
F9-06	Clock: hour	0 to 23	Current time	HH	☆
F9-07	Clock: minute	0 to 59	Current time	MM	☆

These parameters are used to set the current date and time of the system.

These parameters are to control internal time of the system. Time keeping is supported at power failure. You need to set the current system time correctly so that functions related to the time can be implemented.

Function Code	Name	Setting Range	Default	Unit	Property
F9-09	Accumulative running time	0 to 65535	0	h	●
F9-11	High byte of running times	0 to 9999	0	-	●
F9-12	Low byte or running times	0 to 9999	0	-	●

These parameters are used to view the actual accumulative running time and running times of the elevator.

Running times of the elevator = F9-11 x 10000 + F9-12.

Function Code	Name	Setting Range	Default	Unit	Property
F9-13	Maintenance notification period	0 to 99	0	day	☆

It is the forced maintenance notification function.

When this parameter is set to a non-zero value, this function is enabled, and the system starts to count the days. If there is no power-off operation during the counting and the counted days reaches the value of this parameter, the elevator enters the parking state and the system reports Err08, notifying that the elevator must be maintained and cannot run. Maintenance personnel need to power off and maintain the elevator, and then the system clears the value to 0 and starts counting again. If this parameter is set to 0, this function is disabled.

Group FA: Keypad setting parameters

Function Code	Name	Setting Range	Default	Unit	Property
FA-00	Keypad display selection	0 to 3	3	-	☆

The NICE3000new system has three LEDs on the MCB. You can change the

display content through the setting of this parameter.

The values are as follows:

- 0: Reversed display of physical floor
- 1: Positive display of physical floor
- 2: Reversed display of hall call floor
- 3: Positive display of hall call floor

Function Code	Name	Setting Range	Default	Unit	Property
FA-01	Display in running state	1 to 65535	65535	-	☆

FA-01 is used to set the running parameters displayed on the operation panel when the elevator is in the running state.

FA-01 includes 5 binary bits. A total of 5 parameters can be displayed during running. You can press the Shift key to perform shift between displayed parameters. Every parameter is controlled by a binary bit. If a bit is set to 1, the parameter indicated by this bit is displayed; if this bit is set to 0, the parameter is not displayed. You can modify this parameter according to your operating habit.

The 5 binary bits correspond to the running parameters listed in the following table.

Binary Bit	Parameter Name	Default
Bit0	Maximum running speed	1
Bit1	Bus voltage	1
Bit2	Output Voltage	1
Bit3	Output current	1
Bit4	Output frequency	1

The method of viewing FA-01 is as follows:

In the running state, the display of FA-01 is a decimal value. You can press the Shift key to view the parameter indicated by each bit circularly.

Function Code	Name	Setting Range	Default	Unit	Property
FA-02	Display in stop state	1 to 65535	65535	-	☆

FA-02 is used to set the state parameters displayed on the operation panel when the elevator is in the stop state.

FA-02 includes 16 binary bits. A total of 16 parameters can be can be displayed at stop.

The 16 binary bits correspond to the parameters listed in the following table.

Binary Bit	Parameter Name	Default	Binary Bit	Parameter Name	Default
Bit0	Rated elevator speed	1	Bit8	Slow-down distance at rated speed	1
Bit1	Bus voltage	1	Bit9	CTB input state	1
Bit2	Input terminal low bits	1	Bit10	CTB output state	1
Bit3	Input terminal high bits	1	Bit11	System state	1
Bit4	Output terminal	1	Bit12	Reserved	1
Bit5	Current floor	1	Bit13	Reserved	1
Bit6	Current position	1	Bit14	Reserved	1
Bit7	Car load	1	Bit15	Reserved	1

The method of setting and viewing FA-02 is similar to that of FA-01.

The running and stop parameters of the NICE3000^{new} system are the important references for engineers to perform commissioning on site. The parameters are described as follows:

Running speed: indicates the actual running speed of the elevator.
Its maximum value is F0-03 (Maximum running speed), in unit of m/s.

Rated speed: indicates the allowed maximum running speed in the current elevator state, in unit of m/s.

Bus voltage: indicates the DC bus voltage of the NICE3000^{new} system, in unit of V.

Output voltage: indicates the effective value of the equivalent voltage of the PWM wave output by the NICE3000^{new} system, in unit of V.

Output current: indicates the effective value of the actual current when the NICE-3000^{new} system drives the motor to turn, in unit of A.

Output frequency: indicates the actual frequency of the motor during running. It has a fixed corresponding relationship with the running speed. The unit is Hz.

Function Code	Name	Setting Range	Default	Unit	Property
FA-03	Current encoder angle	0.0 to 359.9	0.0	°	●

FA-03 displays the real-time encoder angle. This parameter cannot be modified.

Function Code	Name	Setting Range	Default	Unit	Property
FA-05	MCB board software	0 to 65535	0	-	●
FA-06	Drive board software	0 to 65535	0	-	●

FA-05 and FA-06 are used to view the displays the MCB and drive board software respectively.

The following part describes the example of viewing the MCB version information:

Example MCB version: V16.00-F15.00 -L01.00

When you view FA-05, the operation panel displays the customer No. F15.00; after 3s, it displays the main version and sub version 16.00.

Press STOP/RES, and the operation panel displays the customized and process version L01.00.

If the version is V32.126-L01.06, when you view FA-06, the operation panel displays 32.126.

Press STOP/RES, and it displays the sub version L01.06.

The method of viewing FA-06 is similar to that of FA-05.

Function Code	Name	Setting Range	Default	Unit	Property
FA-07	Heatsink temperature	0 to 100	0	°C	●

FA-07 displays the current temperature of the heatsink.

Normally, the heatsink temperature is below 40°C. When the heatsink temperature is too high, the system lowers the carrier frequency automatically to reduce heat. When the heatsink temperature rises to a certain value, the system reports the module overheat fault and stops running.

Function Code	Name	Setting Range	Default	Unit	Property
FA-11	Pre-torque current	0.0 to 200.0	0	%	●

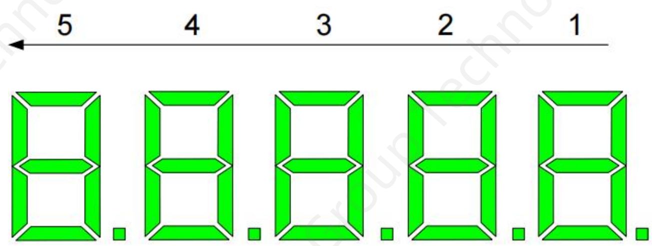
FA-11 displays the percentage of pre-torque current to the rated current (positive/negative display, indicating driving or braking).

Function Code	Name	Setting Range	Default	Unit	Property
FA-12	Logic information	0 to 65535	0	-	●

It displays the elevator and door state.

As shown in the following figure, five LEDs are expressed as 1, 2, 3, 4, and 5 from the right to the left. 1 indicates door 1 state. 2 and 3 are reserved. The combination of 4 and 5 indicates elevator state. The following table shows the specific contents of the numbers:

Figure 6-9　Elevator and door state display



5		4		3	2	1	
Elevator state				Reserved	Reserved	Door 1 state	
00	Inspection state	08	Elevator lock	Reserved	Reserved	0	Waiting state
01	Shaft auto-tuning	09	Idle elevator parking			1	Door open state
02	Micro-leveling	10	Re-leveling at inspection speed			2	Door open limit
03	Returning to base floor at fre emergency	11	Emergency evacuation operation			3	Door close state
04	Firefighter operation	12	Motor auto-tuning			4	Door close limit
05	Fault state	13	Keypad control			5	Running state
06	Attendant operation	14	Base floor verification			-	-
07	Automatic running	15	VIP state			-	-

Function Code	Name	Setting Range	Default	Unit	Property
FA-13	Curve information	0 to 65535	0	-	●

FA-13 displays the system running curve information. LEDs 4 and 3 indicate running curve information. LEDs 2 and 1 indicate running time sequence.

5	4	3	2	1
Time sequence information		No Display	Curve information	
00	Stop state	-	00	Standby state
01	Shorting door lock circuit contactor control		01	Startup speed stage
02	Shorting motor stator and RUN contactor output		02, 03	Acceleration start segment
03	Zero-speed holding		04	Linear acceleration segment
04	Brake contactor output	-	05, 06, 07	Acceleration end segment
05	Curve running		08	Stable-speed running segment
06	Stop zero-speed		09, 10, 11	Deceleration start segment
07	Brake contactor OFF		12	Linear deceleration segment
08	Stop time sequence		13, 14	Deceleration end segment
			15	Curve stop

Function Code	Name	Setting Range	Default	Unit	Property
FA-14	Set speed	0.000 to 4.000	0	m/s	●
FA-15	Feedback speed	0.000 to 4.000	0	m/s	●
FA-16	Bus voltage	0 to 999.9	0	V	●
FA-17	Current position	0.00 to 300.00	0	m	●
FA-18	Output current	0 to 999.9	0	A	●
FA-19	Output frequency	0.00 to 99.99	0	Hz	●
FA-20	Torque current	0 to 999.9	0	A	●
FA-21	Output Voltage	0 to 999.9	0	V	●
FA-22	Output torque	0 to 100	0	%	●
FA-23	Output power	0.00 to 99.99	0	kW	●

FA-14 to FA-23 display the current performance state of the system (the output torque and output power support positive/negative display).

Function Code	Name	Setting Range	Default	Unit	Property
FA-24	Communication interference	0 to 65535	0	-	●

FA-24 displays the current communication quality of the system, as described in the following figure.

5		4		3		2		1	
SPI communication quality of the drive unit		SPI communication quality of the power supply unit		CAN2 communication quality		MOD communication instruction		CAN1 communication quality	
0	High	0	High	0	High	0	High	0	High
↓	↑	↓	↑	↓	↑	↓	↑	↓	↑
9	Interrupted	9	Interrupted	9	Interrupted	9	Interrupted	9	Interrupted

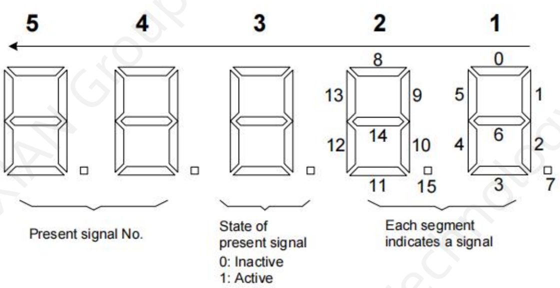
0 to 9 indicate the communication quality, where a larger value indicates stronger interference and lower communication quality.

Function Code	Name	Setting Range	Default	Unit	Property
FA-26	Input state 1	0 to 65535	0	–	●
FA-27	Input state 2	0 to 65535	0	–	●
FA-28	Input state 3	0 to 65535	0	–	●
FA-29	Input state 4	0 to 65535	0	–	●
FA-30	Input state 5	0 to 65535	0	–	●
FA-31	Output state 1	0 to 65535	0	–	●
FA-32	Output state 2	0 to 65535	0	–	●

FA-26 to FA-32 display the system input and output states.

Description of input state 1 display of FA-26

As shown in the following figure, five LEDs are numbered 1, 2, 3, 4, and 5 from right to left. 5 and 4 indicate an input or output terminal function. 3 indicates that this function is enabled (1) or disabled (0). 1 and 2 display the overall state of 16 functions contained in this parameter using 16-segment LEDs.

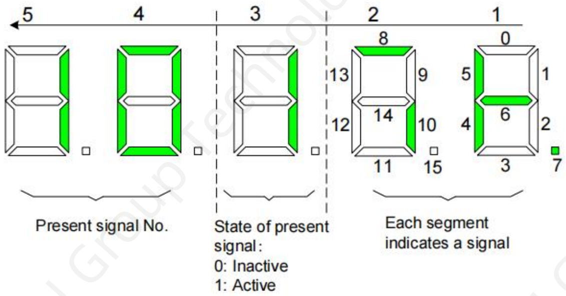


No.	Signal	Number	Definition
0	Reserved	8	Inspection signal
1	Up leveling signal	9	Inspection up signal
2	Down leveling signal	10	Inspection down signal
3	Door zone signal	11	Fire emergency signal
4	Safety circuit feedback	12	Up limit signal
5	Door lock circuit feedback	13	Down limit signal
6	RUN contactor feedback	14	Overload signal
7	Brake contactor feedback	15	Full-load signal

Figure 6-10 FA-26 input state 1 display

Example Displaying the system input and output states

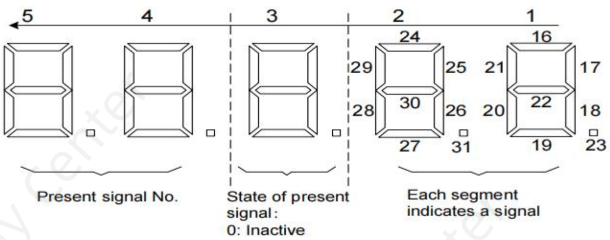
According to the following figure, 5, 4, and 3 indicate that signal 10 (Inspection down) is 1 (Active); besides signal 10, signals 4 (Safety circuit feedback), 5 (Door lock circuit feedback), 6 (RUN contactor feedback), 7 (Brake contactor feedback), and 8 (Inspection signal) are active.



Number	Definition	Number	Definition
0	Reserved	8	Inspection signal
1	Up leveling signal	9	Inspection up signal
2	Down leveling signal	10	Inspection down signal
3	Door zone signal	11	Fire emergency signal
4	Safety circuit feedback	12	Up limit signal
5	Door lock circuit feedback	13	Down limit signal
6	RUN contactor feedback	14	Overload signal
7	Brake contactor feedback	15	Full-load signal

Figure 6-11 Example of FA-26 input state

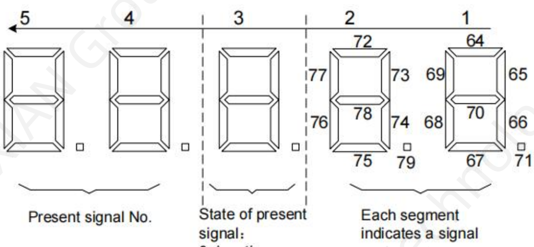
Description of input state 2 display of FA-27



Number	Definition	Number	Definition
16	Up slow-down 1 signal	24	Door machine 1 light curtain
17	Down slow-down 1 signal	25	Door machine 2 light curtain
18	Up slow-down 2 signal	26	Brake travel switch 1 feedback
19	Down slow-down 2 signal	27	UPS input
20	Up slow-down 3 signal	28	Elevator lock input
21	Down slow-down 3 signal	29	Safety circuit 2 feedback
22	Shorting door lock circuit contactor feedback	30	Shorting PMSM stator feedback
23	Firefighter running signal	31	Door lock circuit 2 feedback

Figure 6-12 FA-27 input state 2 display

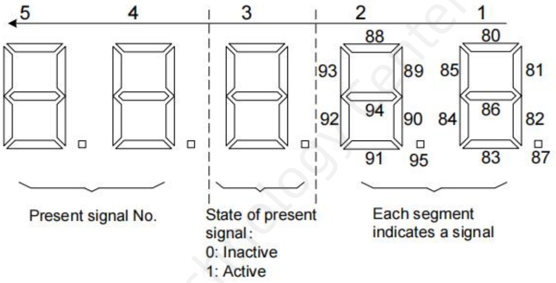
Description of input state 3 display of FA-28



Number	Definition	Number	Definition
32	Reserved	40	Fire emergency floor switchover signal
33	Door machine 1 safety edge signal	41	False floor signal
34	Door machine 2 safety edge signal	42	Reserved
35	Motor overheat signal	43	Reserved
36	Earthquake signal	44	Door 1 open signal
37	Back door forbidden signal	45	Door 2 open signal
38	Light-load	46	Brake travel switch 2 feedback
39	Half-load signal	47	External fault signal

Figure 6-13 FA-28 input state 3 display

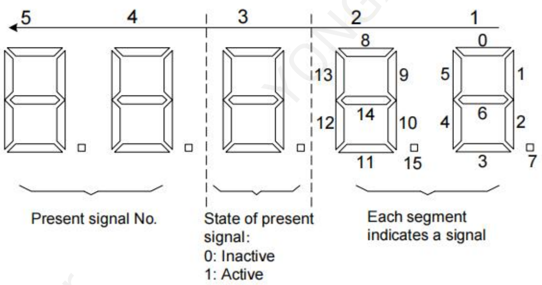
Description of input state 4 display of FA-29



Number	Definition	Number	Definition
48	Terminal floor signal	56	Reserved
49	Door lock short circuit signal	57	Reserved
50	Reserved	58	Reserved
51	Reserved	59	Reserved
52	Reserved	60	Reserved
53	Reserved	61	Reserved
54	Reserved	62	Reserved
55	Reserved	63	Reserved

Figure 6-14 FA-29 input state 4 display

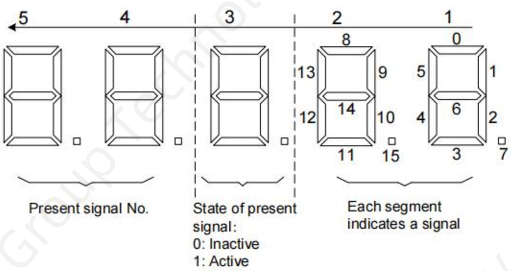
Description of input state 5 display of FA-30



Number	Definition	Number	Definition
0	Reserved	8	Reserved
1	Reserved	9	Reserved
2	Reserved	10	Reserved
3	Reserved	11	Reserved
4	Higher-voltage safety circuit signal	12	Reserved
5	Higher-voltage door lock circuit 1 signal	13	Reserved
6	Higher-voltage door lock circuit 2 signal	14	Reserved
7	Higher-voltage door lock short circuit signal	15	Reserved

Figure 6-15 FA-30 input state 5

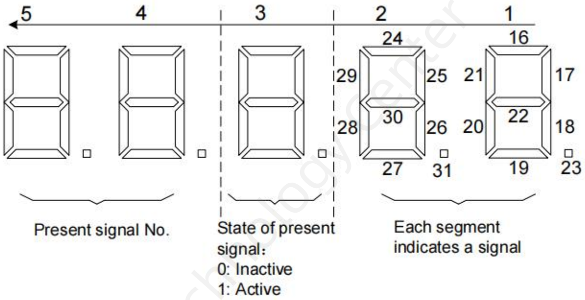
Description of FA-31 input state 1 display



Number	Definition	Number	Definition
0	Reserved	8	Door machine 2 close
1	RUN contactor output	9	Brake and RUN contactorshealthy
2	Brake contactor output	10	Fault state above level 3
3	Shorting door lock circuit contactor control	11	Running state
4	Fire emergency floor arrival signal feedback	12	Shorting motor stator contactor
5	Door machine 1 open	13	Emergency evacuation automatic switchover
6	Door machine 1 close	14	System healthy
7	Door machine 2 open	15	Emergency buzzer control

Figure 6-16 FA-31 input state 1

Description of FA-32 input state 2 display



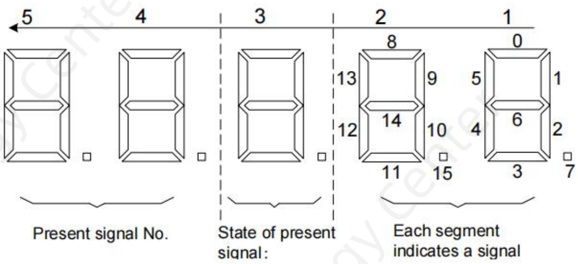
Number	Definition	Number	Definition
16	Higher-voltage startup of brake	24	Reserved
17	Elevator running in up direction	25	Reserved
18	Lamp/Fan running	26	Reserved
19	Medical sterilization	27	Reserved
20	Non-door zone stop	28	Reserved
21	Electric lock	29	Reserved
22	Non-service state	30	Reserved
23	Emergency evacuation completed	31	Reserved

Figure 6-17 FA-32 input state 2

Function Code	Name	Setting Range	Default	Unit	Property
FA-33	Car input state	0 to 65535	0	–	●
FA-34	Car output state	0 to 65535	0	–	●

FA-33 and FA-34 are used to display the car input and output states. Their operating instructions are the same as the MCB input and output display.

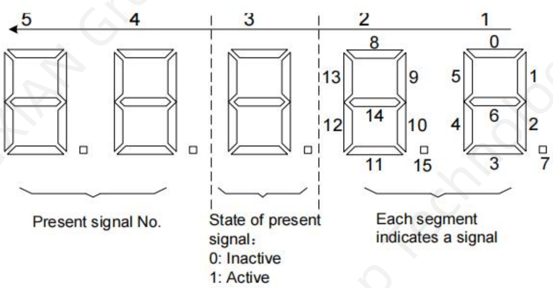
Description of FA-33 car input display



Number	Definition	Number	Definition
0	Reserved	8	Overload input
1	Door 1 light curtain	9	Light-load signal
2	Door 2 light curtain	10	Up leveling communication state
3	Door 1 open limit	11	Down leveling communication state
4	Door 2 open limit	12	Reserved
5	Door 1 close limit	13	Inspection signal
6	Door 2 close limit	14	Running in up direction
7	Full-load input	15	Running in down direction

Figure 6-18 FA-33 car input state

Description of FA-34 car output display



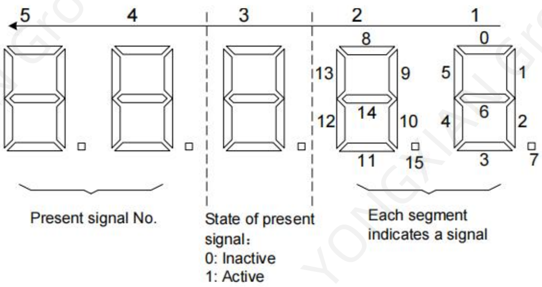
Number	Definition	Number	Definition
0	Reserved	8	Down arrival gong
1	Door 1 open	9	Reserved
2	Door 1 close	10	Reserved
3	Forced door close 1	11	Reserved
4	Door 2 open	12	Reserved
5	Door 2 close	13	Reserved
6	Forced door close 2	14	Reserved
7	Up arrival gong	15	Reserved

Figure 6-19 FA-34 car output state

Function Code	Name	Setting Range	Default	Unit	Property
FA-35	Hall sate	0 to 65535	0	–	●
FA-36	System state 1	0 to 65535	0	–	●
FA-37	System state 2	0 to 65535	0	–	●

These parameters are used to display the hall and system states. Their operating instructions are the same as the MCB input and output display.

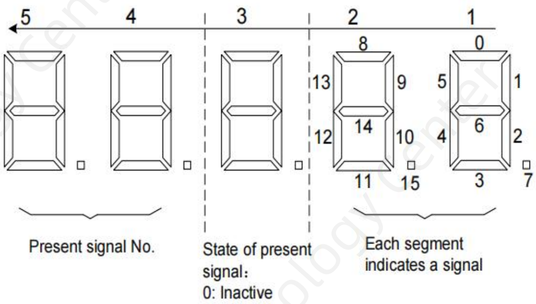
Description of FA-35 hall state display



Number	Definition	Number	Definition
0	Reserved	8	Reserved
1	Elevator lock signal	9	Reserved
2	Fire emergency signal	10	Reserved
3	Current floor forbidden	11	Reserved
4	VIP signal	12	Reserved
5	Security signal	13	Reserved
6	Door close button input	14	Reserved
7	Reserved	15	Reserved

Figure 6-20 FA-35 hall state

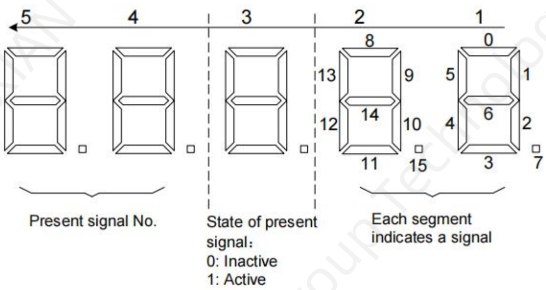
Description of FA-36 system state 1 display



Number	Definition	Number	Definition
0	Door open 1 button	8	Door open 2 button
1	Door close 1 button	9	Door close 2 button
2	Door open delay 1	10	Door open delay 2
3	Direct travel ride switch	11	Reserved
4	Attendant switch	12	Reserved
5	Direction change switch	13	Reserved
6	Independent switch	14	Reserved
7	Fire emergency 2 switch	15	Reserved

Figure 6-21 FA-36 system state 1

Description of FA-37 system state 2 display



Number	Definition	Number	Definition
0	Up direction display	8	Reserved
1	Down direction display	9	Reserved
2	Running state	10	Reserved
3	System full-load	11	Reserved
4	System overload	12	Reserved
5	System half-load	13	Reserved
6	System light-load	14	Reserved
7	Reserved	15	Reserved

Figure 6-22 FA-37 system state 2

Function Code	Name	Setting Range	Default	Unit	Property
FA-38	Maximum floor running time interval	0 to 200	0	s	●

This parameter indicates time required for the elevator to run from the bottom floor to the top floor at normal speed. The smaller value of FA-38+10s and F9-02 is the reference time for motor running protection time. If the leveling signal does not change within the reference time in running, the system report the fault E30 and the elevator stops running.

Function Code	Name	Setting Range	Default	Unit	Property
FA-46	Hall call communication state 1	0 to 65535	0	-	●
FA-47	Hall call communication state 2	0 to 65535	0	-	●
FA-48	Hall call communication state 3	0 to 65535	0	-	●
FA-50	Expansion board hall call communication state 1	0 to 65535	0	-	●
FA-51	Expansion board hall call communication state 2	0 to 65535	0	-	●
FA-52	Expansion board hall call communication state 3	0 to 65535	0	-	●

These parameters display the communication state between HCBs of all floors and the MCB.

FA-46 to FA-48 display the communication state between the MCB Modbus interface and the HCB.

FA-50 to FA-52 display the communication state between the equipment room expansion board and the HCB.

States 1, 2, and 3 respectively correspond to the hall call communication state of floors 1 to 16, 17 to 32, and 33 to 40. The following figure shows the description of viewing the state.

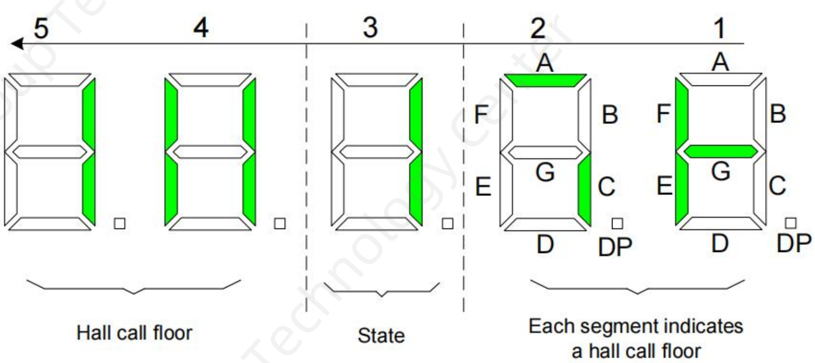


Figure 6-23 Hall call communication state

As shown in the preceding figure, it can be seen from LEDs 3 to 5 that hall call communication at floor 11 is normal. You can view hall calls at other floors by changing LEDs 4 and 5 by pressing the up and down keys. It can be seen from LEDs 1 and 2 that hall call communication at floors 5, 6, 7, 8, 9, and 11 is normal.

Function Code	Name	Setting Range	Default	Unit	Property
FA-58	Version display selection	0: Machine-room-less monitoring board version 1: Equipment room monitoring board 2: Car expansion board version 3: ARD version 4: AFE master version 5: AFE slave version	0	-	☆
FA-59	Expansion board software version	0 to 65535	0	-	●

The combination of FA-58, FA-59 is used to display the expansion board software version.

Example Viewing the equipment room expansion board software version

Set FA-58 to 1 and view FA-59 to obtain the equipment room expansion board software version. For how to view FA-59, refer to FA-05 MCB board software version viewing method.

Group Fb: Door function parameters

Function Code	Name	Setting Range	Default	Unit	Property
Fb-00	Number of door machine(s)	1 to 2	1	-	★

Fb-00 is used to set the number of door machine(s).

Set it to 1 if there is only one door, and 2 if there are double doors.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-01	CTB software	0 to 999	0		●

When the controller is connected to the CTB, this parameter display the CTB software version. For how to view Fb-01, refer to FA-05 MCB board software version viewing method.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-02	Door machine 1 service floors 1	0 to 65535	65535	-	☆
Fb-03	Door machine 1 service floors 2	0 to 65535	65535	-	☆
Fb-18	Door machine 1 service floors 3	0 to 65535	65535	-	☆
Fb-04	Door machine 2 service floors 1	0 to 65535	65535	-	☆
Fb-05	Door machine 2 service floors 2	0 to 65535	65535	-	☆
Fb-19	Door machine 2 service floors 3	0 to 65535	65535	-	☆

These parameters are used to set the service floors of door machine 1 and door machine 2.

Service floor 1 corresponds to floors 1–16.

Service floor 2 corresponds to floors 17–32.

Service floor 3 corresponds to floors 33–48.

These parameters are used to set the service floors of door machine 1 and door machine 2. The setting of door machine service floors is the same as that of service floors in F6-05.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-06	Door open protection time	5 to 99	10	s	☆
Fb-07	Arrival gong output delay	0 to 1000	0	ms	☆
Fb-08	Door close protection time	5 to 99	15	s	☆

Fb-06 is used to set the door open protection time.

After outputting the door open command, if the system does not receive the door open limit signal after the time set in this parameter, the system re-opens the door. When the door open/close times reach the value set in Fb-09, the system reports fault E48.

Fb-07 is used to set the arrival gong output delay.

When the value of this parameter is larger than 10 and the car display is switched over to the destination floor, the system outputs the arrival gong after the time set in this parameter. If the value is smaller than 10, the system outputs the arrival gong at stop.

Fb-08 is used to set the door close protection time.

After outputting the door close command, if the system does not receive the door close limit signal after the time set in this parameter, the system re-closes the door. When the door open/close times reach the value set in Fb-09, the system reports fault E49.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-09	Door open/close protection times	0 to 20	0	-	☆
Fb-10	Door state of standby elevator	0 to 2	0	-	☆

Fb-09 is used to set the door re-open/re-close times allowed when door open/close is abnormal.

Fb-10 is used to set the door state when the elevator is in stop and waiting state The values are as follows:

- 0: Closing the door as normal at base floor
- 1: Waiting with door open at base floor
- 2: Waiting with door open at each floor

Function Code	Name	Setting Range	Default	Unit	Property
Fb-11	Door open holding time for hall call	1 to 1000	5	s	☆
Fb-12	Door open holding time for car call	1 to 1000	3	s	☆
Fb-13	Door open holding time at base floor	1 to 1000	10	s	☆
Fb-14	Door open delay	10 to 1000	30	s	☆

Fb-11 is used to set the door open holding time when there is a hall call. The elevator closes the door immediately after receiving a door close command.

Fb-12 is used to set the door open holding time when there is a car call. The elevator closes the door immediately after receiving a door close command.

Fb-13 is used to set the door open holding time after the elevator arrives at the base floor. The elevator closes the door immediately after receiving a door close command.

Fb-14 is used to set the door open holding time when there is door open delay input. The elevator closes the door immediately after receiving a door close command.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-15	Special door open holding time	10 to 1000	30	s	☆
Fb-16	Manual door open holding time	1 to 60	5	s	☆
Fb-17	Holding time for forced door close	5 to 180	120	s	☆

FB-15 is used to set the door open holding time when there is a disability call.

FB-16 is used to set the door open limit delay in the case of manual door. This parameter is valid when the manual door function is used.

FB-17 is used to set the holding time before forced door close is implemented.

If the forced door close function is enabled, the system enters the forced door close state and sends a forced door close signal when there is no door close signal after the time set in this parameter is reached.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-20	Manual door lock waiting time	0 to 60	0	s	☆

This parameter is used to set interval time to wait from door lock unlocking and locking to the next running startup in the case of manual door.

Function Code	Name	Setting Range	Default	Unit	Property
Fb-24	UCMP test program version	0 to 65535	1	-	●

Fb-24 is the program version of the UCMP test program module.

Group FC: Protection function parameters

Function Code	Name	Setting Range	Default	Unit	Property
FC-00	F5-33 Program control selection	0 to 65535	0	-	★

These parameters are used to select program control functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the bits are described in the following table.

FC-00 Program control selection			
Bit	Function	Description	Default
Bit0	Detection of short circuit to ground at power-on	Whether the motor is short circuited to ground is detected at power-on. If the motor is short circuited to ground, the controller blocks the output immediately, and reports the fault.	1
Bit1	Reserved	-	0
Bit2	Decelerating to stop at valid light curtain	During normal-speed running, the elevator decelerates to stop immediately after the light curtain acts, and then runs to the registered destination floor after the light curtain restores. This function is mainly used in the case of manual door.	0

FC-00 Program control selection			
Bit	Function	Description	Default
Bit9	Mode without door open/close limit	In this mode, the door open/close limit signal is not required, and the system automatically judges door open/close limit. The system determines that door open limit is implemented 3s after the door open command is output and door close limit is implemented 3s after the door close command is output.	0

Function Code	Name	Setting Range	Default	Unit	Property
FC-01	Function selection	0 to 65535	65	-	★

These parameters are used to select program control functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the bits are described in the following table.

FC-01 Function selection			
Bit	Function	Description	Default
Bit0	Overload protection	0: Motor overload detection enabled 1: Motor overload detection disabled	1
Bit1	Canceling protection at output phase loss	It sets whether to implement protection at output phase loss.	0
Bit4	Light curtain judgment at door close limit	At door close limit, the door re-opens if the light curtain is valid.	0
Bit5	Canceling SPI communication judgment	It sets whether to implement wire-breaking detection on SPI communication between the MCB and the drive board.	0
Bit6	Reserved	-	0
Bit8	Reserved	-	0
Bit14	Canceling protection at input phase loss	Canceling protection at input phase loss	0

Function Code	Name	Setting Range	Default	Unit	Property
FC-02	Overload protection coefficient	0.50 to 10.00	1.00	-	★
FC-03	Overload pre-warning coefficient	50 to 100	80	%	★

The FC-02 reference quantity is motor overload current. After detecting that the output current reaches (FC-02 x Rated motor current) and the duration lasts the time specified in the inverse time lag curve, the controller outputs fault E11 indicating motor overload.

The FC-03 reference quantity is motor overload current. After detecting that the output current exceeds (FC-03 x Rated motor current) and the duration lasts the time specified in the inverse time lag curve, the controller outputs a pre-warning signal.

Function Code	Name	Setting Range	Default	Unit	Property
FC-04	Opposite door selection	0 to 3	0	-	★

Fb-00 is used to set the number of door machine(s).

Set it to 1 if there is only one door, and 2 if there are double doors.

FC-04 is used to set opposite door-related control function. The values are as follows:

- 0: Simultaneous control
- 1: Hall call independent, car call simultaneous
- 2: Hall call independent, car call manual control
- 3: Hall call independent, car call independent

Function Code	Name	Setting Range	Default	Unit	Property
FC-11	11th fault code	0 to 9999	0	-	●
FC-12	11th fault subcode	0 to 65535	0	-	●
FC-13	11th fault month and day	0 to 1231	0	MM.DD	●
FC-14	11th fault hour and minute	0 to 23.59	0	HH.MM	●
FC-15	21st fault code	0 to 9999	0	-	●
FC-16	21st fault subcode	0 to 65535	0	-	●
FC-17	21st fault month and day	0 to 1231	0	MM.DD	●
FC-18	21st fault hour and minute	0 to 23.59	0	HH.MM	●
…					
FC-207	60th fault code	0 to 9999	0	-	●
FC-208	60th fault subcode	0 to 65535	0	-	●

Function Code	Name	Setting Range	Default	Unit	Property
FC-209	60th fault month and day	0 to 1231	0	MM.DD	●
FC-210	60th fault hour and minute	0 to 23.59	0	HH.MM	●

If the 10 detailed fault records are full, the earliest detailed fault record will be moved to the latest brief fault record. For example, if a new fault occurs, the fault code, subcode and time information of the fault recorded in group E9 (fault information) will be moved to FC-11 to FC-14.

The brief fault record is a 4-digit number. The two high digits indicate the floor where the car is located when the fault occurs, and the two low digits indicate the fault code. For example, the 1st fault record is 0835, indicating that when the latest brief fault record (fault E35) occurs, the car is near floor 8. The fault subcode is used to locate the causes of the fault. Fault month and day and fault hour and minute record accurate occurrence time of the fault.

Group Fd: Communication parameters

Function Code	Name	Setting Range	Default	Unit	Property
Fd-00	Baud rate	0: 9600 1: 38400	1	-	☆
Fd-02	Local address	0–127 0: Broadcast address	1	-	☆
Fd-03	Communication response delay	0 to 20	0	ms	☆
Fd-04	Communication timeout	0 to 60	0	s	☆

These RS232 serial port communication parameters are used for monitor software communication in the host computer.

Fd-00 specifies the baud rate for serial communication.

Fd-02 specifies the address of the controller. The setting of these two parameters must be consistent with the setting of the serial port parameters on the host computer.

Fd-03 specifies the delay for the controller to send data by means of the serial port.

Fd-04 specifies the communication timeout time of the serial port. Transmission of each frame must be completed within the time set in Fd-04; otherwise, a communication fault occurs.

Function Code	Name	Setting Range	Default	Unit	Property
Fd-05	Re-leveling stop delay	0.00 to 2.00	0.00	s	★

Fd-05 is used to set the re-leveling stop delay. The elevator decelerates to stop after this delay after receiving a single leveling signal during re-leveling.

Function Code	Name	Setting Range	Default	Unit	Property
Fd-07	HCB: JP1 input	0: Invalid 1: Elevator lock signal 2: Fire emergency signal 3: Present floor forbidden 4: VIP floor signal 5: Security floor signal 6 Door close button signal 7: Second fire emergency floor signal	1	-	★
Fd-08	HCB: JP2 input		2	-	★

Fd-07 and Fd-08 are used to set the input parameters of pins 2 and 3 of JP1 and JP2 on the HCB. The setting is effective to the HCBs for all floors.

Function Code	Name	Setting Range	Default	Unit	Property
Fd-09	HCB: JP1 output	0: Invalid 1: Up arrival indicator 2: Down arrival indicator 3: Fault output 4: Non-door zone stop output 5: Non-service state 6: Door close button indicator output	1	-	★
Fd-10	HCB: JP2 output		2	-	★

Fd-09 and Fd-10 are used to set the output parameters of pins 1 and 4 of JP1 and JP2 on the HCB. The setting is effective to the HCBs for all floors.

Function Code	Name	Setting Range	Default	Unit	Property
Fd-11	Expansion board 1: X1 input	0: Reserved NO input: 1: Fire emergency signal 2: Overload signal 3: Full-load signal 4: Firefighter operation 5: Door machine 1 light curtain signal 6: Door machine 2 light curtain signal 7: Brake travel switch feedback 8: UPS valid signal 9: Elevator lock signal 10: Safety circuit signal 2 11: Synchronous motor self-lock feedback 12: Door lock circuit 2 feedback 13: Door machine 1 safety edge signal 14: Door machine 2 safety edge signal 15: Motor overheat signal # 16: Earthquake signal 17: Back door forbidden # 18: Light-load signal # 19: Half-load signal # 20: Fire emergency floor switchover 21: False floor signal 22: Door 1 open 23: Door 2 open 24: Brake travel switch 2 feedback 25: External fault 26: End floor signal 27: Door 2 selection 28: Single/Double door selection NO input NC point + 32	0	-	★
Fd-12	Expansion board 1: X2 input		0	-	★
Fd-13	Expansion board 1: X3 input		0	-	★
Fd-14	Expansion board 1: X4 input		0	-	★
Fd-15	Expansion board 1: X5 input		0	-	★
Fd-16	Expansion board 1: X6 input		0	-	★
Fd-17	Expansion board 1: X7 input		0	-	★
Fd-18	Expansion board 1: X8 input		0	-	★
Fd-19	Expansion board 1: X9 input		0	-	★
Fd-20	Expansion board 1: X10 input		0	-	★
Fd-21	Expansion board 2: X1 input		0	-	★
Fd-22	Expansion board 2: X2 input		0	-	★
Fd-23	Expansion board 2: X3 input		0	-	★
Fd-24	Expansion board 2: X4 input		0	-	★
Fd-25	Expansion board 2: X5 input		0	-	★
Fd-26	Expansion board 2: X6 input		0	-	★
Fd-27	Expansion board 2: X7 input		0	-	★
Fd-28	Expansion board 2: X8 input		0	-	★
Fd-29	Expansion board 2: X9 input		0	-	★
Fd-30	Expansion board 2: X10 input		0	-	★

These parameters are used to set the functions of input terminal X on the expansion card. The NICE3000^{new} system supports up to two expansion cards that are used to expand the input terminal functions in the control cabinet or on the car.

<table>
<tr><th>Function Code</th><th>Name</th><th>Setting Range</th><th>Default</th><th>Unit</th><th>Property</th></tr>
<tr><td>Fd-31</td><td>Expansion board 1: Y1 output</td><td rowspan="20">0: Reserved
1: Door machine 1 open
2: Door machine 1 close
3: Door machine 2 open
4: Door machine 2 close
5: Brake and RUN contactors healthy (no faults E37 and E36)
6: Fault state (output at level 3, 4, and 5 faults)
7: Running monitoring (NICE3000^{new} in running state)
8: Synchronous motor self-lock output
9: Controller healthy
10: Buzzer tweet
11: Higher-voltage startup of brake (continuous 4s)
12: Elevator running in up direction
13: Lamp/Fan running
14: Medical sterilization #
15: Non-door zone stop #
16: Electric lock #
17: Non-service state
18: Emergency evacuation completed
19: Fire emergency operation
20: Power failure emergency output
21: Door lock signal
22: Night output signal</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-32</td><td>Expansion board 1: Y2 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-33</td><td>Expansion board 1: Y3 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-34</td><td>Expansion board 1: Y4 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-35</td><td>Expansion board 1: Y5 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-36</td><td>Expansion board 1: Y6 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-37</td><td>Expansion board 1: Y7 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-38</td><td>Expansion board 1: Y8 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-39</td><td>Expansion board 1: Y9 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-40</td><td>Expansion board 1: Y10 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-41</td><td>Expansion board 2: Y1 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-42</td><td>Expansion board 2: Y2 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-43</td><td>Expansion board 2: Y3 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-44</td><td>Expansion board 2: Y4 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-45</td><td>Expansion board 2: Y5 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-46</td><td>Expansion board 2: Y6 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-47</td><td>Expansion board 2: Y7 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-48</td><td>Expansion board 2: Y8 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-49</td><td>Expansion board 2: Y9 output</td><td>0</td><td>-</td><td>★</td></tr>
<tr><td>Fd-50</td><td>Expansion board 2: Y10 output</td><td>0</td><td>-</td><td>★</td></tr>
</table>

These parameters are used to set the functions of 10 relay outputs on MCTC-KZ-G1. The system supports up to two I/O expansion cards with up to 20 output terminals.

Group FE: Display setting parameters

Function Code	Name	Setting Range	Default	Unit	Property
FE-00	Collective selective mode	0 to 2	0	-	★

It is used to set the collective selective mode of the system. The values are as follows:

- 0: Full collective selective
  The elevator responds to both up and down hall calls.
- 1: Down collective selective
  The elevator responds to down hall calls but does not respond to up hall calls.
- 2: Up collective selective
  The elevator responds to hall up calls but does not respond to hall down calls.

Function Code	Name	Setting Range		Default	Unit	Property
FE-01	Floor 1 display	00: Display "0" 01: Display "1" 02: Display "2" 03: Display "3" 04: Display "4" 05: Display "5" 06: Display "6" 07: Display "7" 08: Display "8" 09: Display "9" 10: Display "A" 11: Display "B" 12: Display "G" 13: Display "H" 14: Display "L" 15: Display "M" 16: Display "P" 17: Display "R" 18: Display "-" 19: No display 20: Display "12" 21: Display "13"	22: Display "23" 23: Display "C" 24: Display "D" 25: Display "E" 26: Display "F" 27: Display "I" 28: Display "J" 29: Display "K" 30: Display "N" 31: Display "O" 32: Display "Q" 33: Display "S" 34: Display "T" 35: Display "U" 36: Display "V" 37: Display "W" 38: Display "X" 39: Display "Y" 40: Display "Z" 41: Display "15" 42: Display "17" 43: Display "19"	1901	-	☆
FE-02	Floor 2 display			1902	-	☆
FE-03	Floor 3 display			1903	-	☆
FE-04	Floor 4 display			1904	-	☆
FE-05	Floor 5 display			1905	-	☆
FE-06	Floor 6 display			1906	-	☆
FE-07	Floor 7 display			1907	-	☆
FE-08	Floor 8 display			1908	-	☆
FE-09	Floor 9 display			1909	-	☆
FE-10	Floor 10 display			0100	-	☆
Floor 11 to floor 30 display				...		
FE-31	Floor 31 display			0301	-	☆
FE-35	Floor 32 display			0302	-	☆
FE-36	Floor 33 display			0303	-	☆
FE-37	Floor 34 display			0304	-	☆
FE-38	Floor 35 display			0305	-	☆
FE-39	Floor 36 display			0306	-	☆
FE-40	Floor 37 display			0307	-	☆
FE-41	Floor 38 display			0308	-	☆
FE-42	Floor 39 display			0309	-	☆
FE-43	Floor 40 display			0400	-	☆

These parameters are used to set the display of each floor. The setting range is 0000–9999, where the two high digits indicate the display code of the ten's digit, and the two low digits indicate the display code of the unit's digit.

Function Code	Name	Setting Range	Default	Unit	Property
FE-52	Highest digit selection 1	0 to 5699	0	-	☆
FE-53	Highest digit selection 2		0	-	☆
FE-54	Highest digit selection 3		0	-	☆
FE-56	Highest digit selection 4		0	-	☆
FE-69	Highest digit selection 5		0	-	☆

FE-52 to FE-56 are used to set special display of floors.

When the 2-digit display cannot meet the requirement, you can add the third-digit display by setting these parameters as follows:

Step 1: Set the two high digits for indicating the floor address that requires special display, and set the two low digits for indicating the display content. For example, if floor 18 needs to be displayed as “17A”, set FE-18 to 0710 (displaying “7A”) and then set the FE-65 to 1801 (displaying “1”).

Step 2: Set F8-14 Bit0 to 1.

Step 3: Power off the system and power it on again.

Function Code	Name	Setting Range	Default	Unit	Property
FE-32	Elevator function selection 1	0 to 65535	34816	-	☆

Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of FE-32 are described in the following table.

FE-32 Elevator function selection 1			
Bit	Function	Description	Default
Bit0	Reserved	-	0
Bit1	Reserved	-	0
Bit2	Re-leveling function	The elevator performs re-leveling at a low speed with door open. An external shorting door lock circuit contactor needs to be used together.	0
Bit3	Door pre-open function	During normal stop, when the elevator speed is smaller than a certain value and the door zone signal is active, the system shorts the door lock by means of the shorting door lock circuit contactor and outputs the door open signal, implementing door pre-open. This improves the elevator use efficiency.	0
Bit4	Stuck hall call cancellation	The system automatically identifies the state of the hall call buttons. If the state is abnormal, the system cancels the stuck hall call.	0
Bit5	Night security floor function	From 10:00 p.m to 6:00 a.m., the elevator runs to the security floor first every time, stops and opens the door, and then runs to the destination floor.	0
Bit6	Down collective selective peak service	The peak service at down collective selective is used.	0
Bit7	Parallel/Group control peak service	The peak service is used.	0
Bit8	Time-based service floor function	For details, see the description of related parameters in group F6.	0
Bit9	VIP function	The VIP function is used.	0
Bit10	Reserved	-	0
Bit11	Car call deletion	A call can be deleted by pressing the button twice consecutively.	1
Bit12	Hall call deletion		0
Bit13 to Bit15	Reserved	-	0

Function Code	Name	Setting Range	Default	Unit	Property
FE-33	Elevator function selection 2	0 to 65535	36	-	☆

Each bit of the function code defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.

The functions defined by the binary bits of FE-33 are described in the following table.

FE-33 Elevator function selection 2			
Bit	Function	Description	Default
Bit0	Reserved	-	0
Bit1	Door open holding at open limit	The system still outputs the door open command upon door open limit.	0
Bit2	Door close command not output upon door close limit	The system stops outputting the door close command upon door close limit.	1
Bit3	Reserved	-	0
Bit4	Auto reset for RUN and brake contactor stuck	If the feedback of the RUN and brake contactors is abnormal, faults E36 and E37 are reported, and you need to manually reset the system. With this function, the system resets automatically after the fault symptom disappears. A maximum of three auto reset times are supported.	0
Bit5	Slow-down switch stuck detection	The system detects the state of slow-down switches. Once detecting that a slow-down switch is stuck, the system instructs the elevator to slow down immediately and reports a corresponding fault.	1
Bit6	Reserved	-	0
Bit7	Forced door close	If the door still does not close within the time set in Fb-17 in automatic state, the system outputs the forced door close signal; at this moment, the light curtain becomes invalid and the buzzer tweets.	0
Bit8	Reserved	-	-
Bit10 to Bit12	Reserved	-	-
Bit13	High-speed elevator protection function	A maximum allowable speed is set when the car is in the slowdown switch position. When the elevator exceeds the speed at the position, the system outputs a protection signal.	0
Bit14	Reserved	-	0
Bit15	Opposite door independent control	The independent control function of the opposite door is enabled.	0

Group FP: User parameters

Function Code	Name	Setting Range	Default	Unit	Property
FP-00	User password	0 to 65535	0	-	☆

FP-00 is used to set the user password. 0 indicates no password.

The password prohibits unauthorized personnel from viewing and modifying parameters. If it is set to any non-zero number, the password protection function is enabled. After a password has been set and taken effect, you must enter the correct password in order to enter the menu. If the entered password is incorrect, you cannot view or modify parameters.
If FP-00 is set to 00000, the previously set user password is cleared, and the password protection function is disabled.

■ Remember the password that you set. If the password is set incorrectly or forgotten, contact Inovance to replace the control board.

Function Code	Name	Setting Range	Default	Unit	Property
FP-01	Parameter update	0: No operation 1: Restore default setting 2: Clear fault records 3: Clear shaft data	0	-	★

FP-01 is used to reset some system parameters.

The values are as follows:

■ 0: None

■ 1: Restore default setting. All parameters except group F1 are restored to the default settings. Be cautions with this setting.

■ 2: Clear fault records. Fault records are cleared. FC-11 to FC-210 and parameters in groups E0 to E9 are set to 0.

■ 3: Clear shaft information: Floor pulse data in the shaft is cleared. Shaft pulses of F3-12 to F3-17 and group F4 are set to 0. The leveling adjustment parameters in group Fr are set to 30030. Shaft auto-tuning must be performed again after clearing.

Function Code	Name	Setting Range	Default	Unit	Property
FP-02	User-defined parameter display	0: Invalid 1: Valid	0	-	★

FP-02 is used to view the parameters that are different from the default setting. When it is set to 1, you can view the parameters that are different from the default setting.

Function Code	Name	Setting Range	Default	Unit	Property
FP-05	Contract No. 2	0 to 65535	0	-	★
FP-06	Contract No. 1	0 to 65535	5555	-	★

FP-05 and FP-06 are used to set manufacturer contract No. Contract No. is used in the HCB or door machine software requiring contract No. check. If the contract No. check fails, the system cannot work properly.

Group Fr: Leveling adjustment parameters

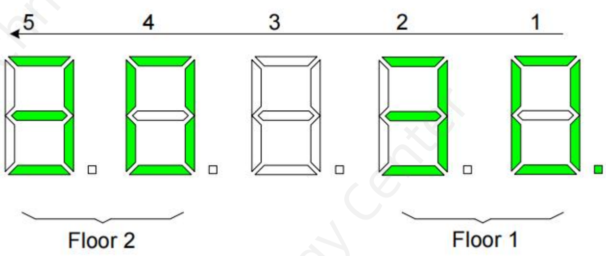
Function Code	Name	Setting Range	Default	Unit	Property
Fr-00	Leveling adjustment function	0: Invalid 1: Enabled	0	-	★

Fr-00 is used to set whether to enable the leveling adjustment function.

Function Code	Name	Setting Range	Default	Unit	Property
Fr-01	Leveling adjustment record 1	00000 to 60060	30030	mm	★
Fr-02	Leveling adjustment record 2		30030	mm	★
to	to		to	to	to
Fr-20	Leveling adjustment record 20		30030	mm	★

These parameters are used to record the leveling adjustment values. Each parameter records the adjustment information of two floors, and therefore, 56 floor adjustment records are supported totally. The method of viewing the record is shown in the following figure.

Figure 6-24 Viewing the leveling adjustment record



As shown in the preceding figure, the left two LEDs and the right two LEDs respectively show the adjustment bases of the first floor and second floor. If the value is larger than 30, it is upward leveling adjustment; if the value is smaller than 30, it is downward leveling adjustment. The default value "30" indicates that there is no leveling adjustment. The maximum adjustment range is ±30 mm.

The flowchart of single-floor leveling accuracy adjustment is shown in the following figure.

Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.

After you set Fr-00 to 1, the elevator shields hall calls, automatically runs to the top floor, and keeps the door open after arrival. If the elevator has been at the top floor, it directly keeps the door open.

Go into the car, press the top floor button once, and the leveling position is changed 1 mm upward; press the bottom floor button once, and the leveling position is changed 1 mm downward. The value is displayed in the car. Positive value: up arrow + value, negative value: down arrow + value,

adjustment range: ±30 mm.

After completing adjustment, press the top floor button and bottom floor button in the car at the same time to save the adjustment result. The car display restores to the normal state. If the leveling position of the current floor need not be adjusted, you also need to press the top floor button and bottom floor button in the car at the same time to exit the leveling adjustment state. Note that if a certain floor need not adjustment, you also need to save the data once. Otherwise, you cannot register the car call.

Press the door close button to register a car call. The elevator runs to the next floor for adjustment and keeps the door open after arrival.

After completing adjustment for all floors, set Fr-00 to 0 to disable the leveling adjustment function. Otherwise, the elevator cannot be used.

Group E0-E9: Fault record parameters

Function Code	Name	Setting Range	Default	Unit	Property
E0-00	Last fault code	0 to 9999	0		●
E0-01	Last fault subcode	0 to 65535	0		●
E0-02	Last fault month and day	0 to 1231	0	MM.DD	●
E0-03	Last fault hour and minute	0 to 23.59	0	HH.MM	●
E0-04	Last fault logic information	0 to 65535	0		●
E0-05	Last fault curve information	0 to 65535	0		●
E0-06	Speed reference upon last fault	0.000 to 4.000	0	m/s	●
E0-07	Feedback speed upon last fault	0.000 to 4.000	0	m/s	●
E0-08	Bus voltage upon last fault	0 to 999.9	0	V	●
E0-09	Present position upon last fault	0.0 to 300.0	0	m	●
E0-10	Output current upon last fault	0.0 to 999.9	0	A	●
E0-11	Output frequency upon last fault	0.00 to 99.99	0	Hz	●

Function Code	Name	Setting Range	Default	Unit	Property
E0-12	Torque current upon last fault	0.0 to 999.9	0	A	●
E0-13	Output voltage upon last fault	0 to 999.9	0	V	●
E0-14	Output torque upon last fault	0 to 200.0	0	%	●
E0-15	Output power upon last fault	0.00 to 99.99	0	kW	●
E0-16	Communication interference upon last fault	0 to 65535	0		●
E0-17	Reserved	0 to 65535	0		●
E0-18	Input state 1 upon last fault	0 to 65535	0		●
E0-19	Input state 2 upon last fault	0 to 65535	0		●
E0-20	Input state 3 upon last fault	0 to 65535	0		●
E0-21	Input state 4 upon last fault	0 to 65535	0		●
E0-22	Input state 5 upon last fault	0 to 65535	0		●
E0-23	Output state 1 upon last fault	0 to 65535	0		●
E0-24	Output state 2 upon last fault	0 to 65535	0		●
E0-25	Car input state upon last fault	0 to 65535	0		●
E0-26	Car output state upon last fault	0 to 65535	0		●
E0-27	Hall call state upon last fault	0 to 65535	0		●
E0-28	System state 1 upon last fault	0 to 65535	0		●
E0-29	System state 2 upon last fault	0 to 65535	0		●
		. . .			
E9-00	10th fault code	0 to 9999	0		●
E9-01	10th fault subcode	0 to 65535	0		●
E9-02	10th fault month and day	0 to 1231	0	MM.DD	●
E9-03	10st fault hour and minute	0 to 23.59	0	HH.MM	●
E9-04	10st fault logic information	0 to 65535	0		●
E9-05	10st fault curve information	0 to 65535	0		●
E9-06	Speed reference upon 10st fault	0.000 to 4.000	0	m/s	●
E9-07	Feedback speed upon 10st fault	0.000 to 4.000	0	m/s	●
E9-08	Bus voltage upon 10st fault	0 to 999.9	0	V	●
E9-09	Present position upon 10st fault	0.0 to 300.0	0	m	●
E9-10	Output current upon 10st fault	0.0 to 999.9	0	A	●

Function Code	Name	Setting Range	Default	Unit	Property
E9-11	Output frequency upon 10st fault	0.00 to 99.99	0	Hz	●
E9-12	Torque current upon 10st fault	0.0 to 999.9	0	A	●
E9-13	Output voltage upon 10st fault	0 to 999.9	0	V	●
E9-14	Output torque upon 10th fault	0 to 200.0	0	%	●
E9-15	Output power upon 10st fault	0.00 to 99.99	0	kW	●
E9-16	Communication interference upon 10st fault	0 to 65535	0		●
E9-17	Reserved	0 to 65535	0		●
E9-18	Input state 1 upon 10th fault	0 to 65535	0		●
E9-19	Input state 2 upon 10th fault	0 to 65535	0		●
E9-20	Input state 3 upon 10th fault	0 to 65535	0		●
E9-21	Input state 4 upon 10th fault	0 to 65535	0		●
E9-22	Input state 5 upon 10th fault	0 to 65535	0		●
E9-23	Output state 1 upon 10th fault	0 to 65535	0		●
E9-24	Output state 2 upon 10th fault	0 to 65535	0		●
E9-25	Car input state upon 10st fault	0 to 65535	0		●
E9-26	Car output state upon 10st fault	0 to 65535	0		●
E9-27	Hall call state upon 10st fault	0 to 65535	0		●
E9-28	System state 1 upon 10th fault	0 to 65535	0		●
E9-29	System state 2 upon 10th fault	0 to 65535	0	-	●

These parameters record the last 10 faults and list the system states for every fault in detail.

Memo NO. __________

Date / /

7 Troubleshooting

7.1 Elevator Fault Display

When the controller detects faults, it alerts and records related information:

The keypad displays the current fault code and subcode, such as E22-101.

Figure 7-1 Fault code and subcode display on the keypad

When an operation panel is connected, it displays the current fault code, such as Err22.

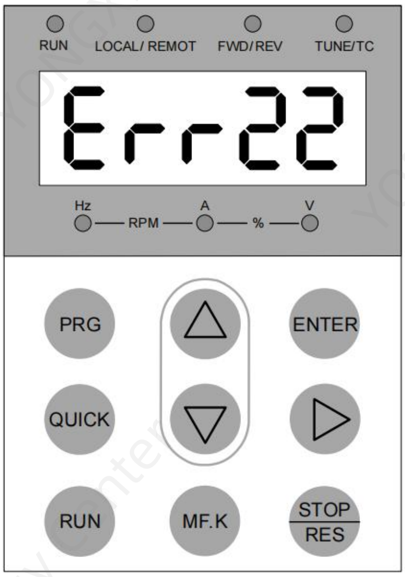
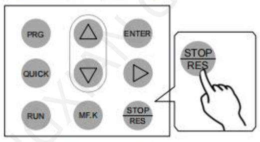
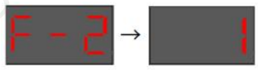
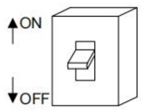


Figure 7-2 Fault code display on the operation panel

When F-2 is set to 2 with the keypad, it displays the information about the last 10 faults, including fault code, subcode, and time.

The integrated elevator controller records detailed information about the last 10 faults and simple information about 50 groups of faults. For details, refer to the parameter description of groups E0 to E9 and FC-11 to FC-210.

7.2 Restart after Fault

Stage	Measures	Remarks
When the fault occurs	When F-2 is set to 2 with the keypad, it displays the information about the last 10 faults, including fault code, subcode, and time.	For details, refer to the parameter description of groups E0 to E9 and FC-11 to FC-210.
Before the fault is reset	Identify and eliminate any fault cause according to a fault code displayed on the operation panel.	Perform troubleshooting by referring to "7.4 Fault Information and Troubleshooting".
Fault reset method	Automatic reset of faults In case of some faults, if automatic reset conditions are satisfied after troubleshooting, the controller automatically resets faults.	
	Manual reset of faults Some faults have to be manually reset by pressing  on the operation panel or setting F-2 to 1 with the keypad.	Press the red Stop/Reset key on the operation panel.  Set F-2 to 1 
	Fault reset upon power-off Some faults have to be reset by cutting off the power of the controller and turning it on again after troubleshooting.	

7.3 Description of Fault Levels

The NICE3000^{new} has almost 70 pieces of alarm information and protective functions. It monitors various input signals, running conditions and feedback signals. If a fault occurs, the system implements the relevant protective function and displays the fault code.

The controller is a complicated electronic control system and the displayed fault information is graded into five levels according to the severity. The faults of different levels are handled according to the following table.

Table 7-1 Fault Levels

Fault Level	Fault State	Solution
Level 1	◆ Display the fault code. ◆ Output the fault relay action command.	◆ 1A – The elevator running is not affected on any condition.
Level 2	◆ Display the fault code. ◆ Output the fault relay action command. ◆ Continue normal running of the elevator.	◆ 2A – The parallel/group control l function is disabled.
		◆ 2B – The door pre-open/re-leveling function is disabled.
Level 3	◆ Display the fault code. ◆ Output the fault relay action command. ◆ Stop output and apply the brake immediately after stop.	◆ 3A – In low-speed running, the elevator stops at special deceleration rate, and cannot restart.
		◆ 3B – In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3s.
Level 4	◆ Display the fault code. ◆ Output the fault relay action command. ◆ In distance control, the elevator decelerates to stop and cannot run again.	◆ 4A – In low-speed running, the elevator stops at special deceleration rate, and cannot restart.
		◆ 4B – In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3s.
		◆ 4C – In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3s.
Level 5	◆ Display the fault code. ◆ Output the fault relay action command. ◆ The elevator stops immediately.	◆ 5A – In low-speed running, the elevator stops immediately and cannot restart.
		◆ 5B – In low-speed running, the elevator does not stop. In normal-speed running, the elevator stops, and then can start running at low speed after a delay of 3s.

7.4 Fault Information and Troubleshooting

If a fault is reported, the system performs corresponding processing based on the fault level. Handle the fault according to the possible causes described in the following table.

Fault Code	Name	Possible Causes	Solution	Level
Err02	Overcurrent during acceleration	The main circuit output is grounded or short circuited.	◆ Check whether the motor and grounding cables are connected correctly. ◆ Check whether the shorting PMSM stator contactor causes short circuit at the controller output side. ◆ Check whether the motor cables have damaged jacket	5A
		Motor auto-tuning is performed improperly.	◆ Check whether motor parameters comply with the nameplate. Perform motor auto-tuning again.	
		The encoder signal is incorrect.	◆ Check whether encoder pulses per revolution (PPR) is set correctly. ◆ Check whether the encoder signal is interfered with, whether the encoder cable runs through the duct independently, whether the cable is too long, and whether the shield is grounded at one end. ◆ Check whether the encoder is installed reliably, whether the rotating shaft is connected to the motor shaft reliably by observing whether the encoder is stable during normal-speed running. ◆ Check whether the encoder wirings are correct. For the asynchronous motor, perform SVC and compare the current to judge whether the encoder works properly.	
		The phase sequence of the motor is incorrect.	◆ Exchange the motor UVW phase sequence.	
		The acceleration time is too short.	◆ Reduce the acceleration rate.	

Fault Code	Name	Possible Causes	Solution	Level
Err03	Overcurrent during deceleration	The main circuit output is grounded or short circuited.	◆ Check whether the motor and grounding cables are connected correctly. ◆ Check whether the shorting PMSM stator contactor causes short circuit at the controller output side. ◆ Check whether the motor cables have damaged jacket.	5A
		Motor auto-tuning is performed improperly.	◆ Check whether motor parameters comply with the nameplate. Perform motor auto-tuning again.	
		The encoder signal is incorrect.	◆ Check whether encoder pulses per revolution (PPR) is set correctly. ◆ Check whether the encoder signal is interfered with, whether the encoder cable runs through the duct independently, whether the cable is too long, and whether the shield is grounded at one end. ◆ Check whether the encoder is installed reliably, whether the rotating shaft is connected to the motor shaft reliably by observing whether the encoder is stable during normal-speed running. ◆ Check whether the encoder wirings are correct. For the asynchronous motor, perform SVC and compare the current to judge whether the encoder works properly.	
		The deceleration rate is too short.	◆ Reduce the deceleration rate.	
Err04	Overcurrent at constant speed	The main circuit output is grounded or short circuited.	◆ Check whether the motor and grounding cables are connected correctly. ◆ Check whether the shorting PMSM stator contactor causes short circuit at the controller output side. ◆ Check whether the motor cables have damaged jacket.	5A
		Motor auto-tuning is performed improperly.	◆ Check whether motor parameters comply with the nameplate. Perform motor auto-tuning again.	
		The encoder signal is incorrect.	◆ Check whether encoder pulses per revolution (PPR) is set correctly. ◆ Check whether the encoder signal is interfered with, whether the encoder cable runs through the duct independently, whether the cable is too long, and whether the shield is grounded at one end. ◆ Check whether the encoder is installed reliably, whether the rotating shaft is connected to the motor shaft reliably by observing whether the encoder is stable during normal-speed running. ◆ Check whether the encoder wirings are correct. For the asynchronous motor, perform SVC and compare the current to judge whether the encoder works properly.	

Fault Code	Name	Possible Causes	Solution	Level
Err05	Overvoltage during acceleration	The input voltage is too high.	◆ Check whether the input voltage is too high. Observe whether the bus voltage is too high (normal: 540–580 V for 380 voltage input).	5A
		The regen. resistance is too large, or the braking unit fails.	◆ Check for the balance coefficient. ◆ Check whether the bus voltage rises too quickly during running. If yes, the braking resistor does not work or its model is improper: ◆ Check whether the cable connecting the braking resistor is damaged, whether the cooper wire touches the ground, and whether the connection is reliable. ◆ Check whether the resistance is proper based on the recommendation in chapter 4 and select a proper braking resistor. ◆ If a braking unit is used, check whether the braking unit works properly and whether the model is proper. If the resistance of the braking resistor is proper and overvoltage occurs each time when the elevator reaches the target speed, decrease the values of F2-01 or F2-04 to reduce the curve following error and prevent overvoltage due to system overshoot.	
		The acceleration rate is too short.	◆ Reduce the acceleration rate.	
Err06	Overvoltage during deceleration	The input voltage is too high.	◆ Check whether the input voltage is too high. Observe whether the bus voltage is too high (normal: 540–580 V for 380 voltage input).	5A
		The regen resistance is too large, or the braking unit fails.	◆ Check for the balance coefficient. ◆ Check whether the bus voltage rises too quickly during running. If yes, the braking resistor does not work or its model is improper: ◆ Check whether the cable connecting the braking resistor is damaged, whether the cooper wire touches the ground, and whether the connection is reliable. ◆ Check whether the resistance is proper based on the recommendation in chapter 4 andselect a proper braking resistor. ◆ If a braking unit is used, check whether the braking unit works properly and whether the model is proper. If the resistance of the braking resistor is proper and overvoltage occurs each time when the elevator reaches the target speed, decrease the values of F2-01 or F2-04 to reduce the curve following error and prevent overvoltage due to system overshoot.	
		The deceleration rate is too short.	◆ Reduce the deceleration rate.	

Fault Code	Name	Possible Causes	Solution	Level
Err07	Overvoltage at constant speed	The input voltage is too high.	◆ Check whether the input voltage is too high. Observe whether the bus voltage is too high (normal: 540–580 V for 380 voltage input).	5A
		The regen. resistance is too large, or the braking unit fails.	◆ Check for the balance coefficient. ◆ Check whether the bus voltage rises too quickly during running. If yes, the braking resistor does not work or its model is improper: ◆ Check whether the cable connecting the braking resistor is damaged, whether the cooper wire touches the ground, and whether the connection is reliable. ◆ Check whether the resistance is proper based on the recommendation in chapter 4 andselect a proper braking resistor. ◆ If a braking unit is used, check whether the braking unit works properly and whether the model is proper. If the resistance of the braking resistor is proper and overvoltage occurs each time when the elevator reaches the target speed, decrease the values of F2-01 or F2-04 to reduce the curve following error and prevent overvoltage due to system overshoot.	
Err08	Maintenance notification period reached	The elevator is not maintained within the notification period.	◆ Power-off and maintain the elevator. ◆ Disable the maintenance notification function by setting F9-13 to 0. ◆ Contact the agent or the manufacturer.	5A
Err09	Undervoltage	Instantaneous power failure occurs on the input power supply.	◆ Check whether the power fails during running. ◆ Check whether the wiring of all power input cables is secure.	5A
		The input voltage is too low.	◆ Check whether the external power voltage is too low.	
		The drive control board fails.	◆ Contact the agent or the manufacturer.	

Fault Code	Name	Possible Causes	Solution	Level
Err10	Controller overload	The mechanical resistance is too large.	◆ Check whether the brake is released, and whether the brake power supply is normal. ◆ Check whether the guide shoes are too tight.	5A
		The balance coefficient is improper	◆ Check whether the balance coefficient is correct.	
		The encoder feedback signal is abnormal.	◆ Check whether the encoder feedback signal and parameter setting are correct, and whether the initial angle of the encoder for the PMSM is correct.	
		Motor auto-tuning is not performed properly (the elevator running current is higher than the normal in this case).	◆ Check the motor parameter setting and perform motor auto-tuning again. ◆ If this fault is reported when the slip experiment is carried on, perform the slip experiment by using the function set in F3-24.	
		The phase sequence of the motor is incorrect.	◆ Check whether the UVW phase sequence of the motor is right.	
		The AC drive model is of too low power class.	◆ Check whether the current has exceeded the rated current of the AC drive during stable-speed running of the elevator with empty car.	
Err11	Motor overload	The mechanical resistance is too large.	◆ Check whether the brake is released, and whether the brake power supply is normal. ◆ Check whether the guide shoes are too tight.	5A
		The balance coefficient is improper	◆ Check whether the balance coefficient is correct.	
		Motor auto-tuning is not performed properly (the elevator running current is higher than the normal in this case).	◆ Check the motor parameter setting and perform motor auto-tuning again. ◆ If this fault is reported when the slip experiment is carried on, perform the slip experiment by using the function set in F3-24.	
		The phase sequence of the motor is incorrect.	◆ Check whether the UVW phase sequence of the motor is right.	
		The motor model is of too low power class.	◆ Check whether the current has exceeded the rated current of the motor during stable-speed running of the elevator with empty car.	
Err12	Power supply phase loss	The power input phases are not symmetric.	◆ Check whether the three phases of power supply are lost. ◆ Check whether the three phases of power supply are balanced. ◆ Check whether the power voltage is normal. If not, adjust the power supply.	5A
		The drive control board fails.	◆ Contact the agent or the manufacturer.	
Err13	Power output phase loss	The output wiring of the main circuit is loose.	◆ Check whether the motor wiring is secure. ◆ Check whether the RUN contactor on the output side is normal.	5A
		The motor is damaged.	◆ Check whether the motor is internally abnormal.	

Fault Code	Name	Possible Causes	Solution	Level
Err14	Module overheat	The ambient temperature is too high.	◆ Lower the ambient temperature.	5A
		The fan is damaged.	◆ Replace the fan.	
		The air filter is blocked.	◆ Clear the air filter. ◆ Check whether the installation clearance of the controller satisfies the requirement.	
Err15	Output abnormal	Subcode 1: The regen. resistor is short circuited.	◆ Check wiring of the regen. resistor and braking unit is correct, without short-circuit. ◆ Check whether the main contactor works properly and whether there is arch or stuck problem.	5A
		Subcode 2: The braking IGBT is short circuited.	◆ Contact the agent or Inovance.	
Err16	Current control fault	Subcode 1: The excitation current deviation is too large. Subcode 2: The torque current deviation is too large.	◆ Check whether the input voltage is low (often in temporary power supply) ◆ Check whether cable connection between the controller and the motor is secure. ◆ Check whether the RUN contactor works properly.	5A
		Subcode 3: The speed deviation is too large.	◆ Check the circuit of the encoder. ◆ Check whether encoder pulses per revolution (PPR) is set correctly. ◆ Check whether the encoder signal is interfered with. ◆ Check whether the encoder cable runs through the duct independently, the cable is too long, or the shield is grounded at one end. ◆ Check whether the encoder is installed reliably, the rotating shaft is connected to the motor shaft reliably, or the encoder is stable during normal-speed running. ◆ Check whether the motor parameters are correct, and perform motor auto-tuning again. ◆ Increase the torque upper limit in F2-08.	
Err17	Encoder interference during motor auto-tuning	Subcode 1: Reserved.	◆ Reserved	5A
		Subcode 2: The SIN/COS encoder signal is abnormal.	◆ Serious interference exists in the C, D, and Z signals of the SIN/COS encoder. Check whether the encoder cable is laid separately from the power cables, and whether system grounding is reliable. ◆ Check whether the PG card is wired correctly.	
		Subcode 3: The UVW encoder signal is abnormal.	◆ Serious interference exists in the U, V, and W signals of the UVW encoder. Check whether the encoder cable is laid separately from the power cables, and whether system grounding is reliable. ◆ Check whether the PG card is wired correctly.	

Fault Code	Name	Possible Causes	Solution	Level
Err18	Current detection fault	The drive control board fails.	◆ Contact the agent or the manufacturer.	5A
Err19	Motor auto-tuning fault	Subcode 1: Stator resistance auto-tuning fails.	◆ Check the motor wiring.	5A
		Subcode 5: Magnetic pole position auto-tuning fails.		
		Subcode 8: Synchronous motor static auto-tuning is selected, but the encoder type is not SIN/COS encoder.	◆ Select other auto-tuning modes or change the encoder type to SIN/COS encoder.	
		Subcode 9: CD signal fluctuation is too large in synchronous motor static auto-tuning.	◆ Hardware interference exists in the CD signals of the SIN/COS encoder. Check whether grounding is normal.	
		Subcode 12: The encoder initial angle is not learned during angle-free auto-tuning of synchronous motor so that an alarm is given.	◆ For semi-automatic angle-free auto-tuning, the elevator can run at normal speed only after the encoder initial angle is obtained in inspection mode.	

Fault Code	Name	Possible Causes	Solution	Level
Err20	Speed feedback incorrect	Subcode 1: The encoder signal is not detected during synchronous motor no-load auto-tuning.	◆ Check whether the encoder signal circuit is normal. ◆ Check whether the PG card is normal. ◆ Check whether the brake has been released.	5A
		Subcode 4: The Z signal cannot be detected during synchronous motor autotuning.	◆ Check whether the encoder signal circuit is normal. ◆ Check whether the PG card is normal.	
		Subcode 5: The cables of the SIN/COS encoder break.		
		Subcode 7: The cables of the UVW encoder break.		
		Subcode 14: The Z signal is lost during normal running		
		Subcode 2, 8: Reserved.	◆ Reserved	
		Subcode 3, 15: The motor cable sequence is incorrect, the motor brake is not started, or the encoder signal quality is poor.	◆ Exchange the cable sequence of any two of U, V, and W phases of the motor. ◆ Check whether the brake is started during synchronous motor with-load auto-tuning. ◆ Check the encoder signal circuit.	
		Subcodes 3, 15: The phase sequence of the motor is incorrect.	◆ Exchange any two phases of the motor UVW cables. ◆ Check whether the brake is released during with-load auto-tuning of the synchronous motor.	
		Subcode 9: The speed deviation is too large.	◆ The angle of the synchronous motor is abnormal. Perform motor auto-tuning again. ◆ Reduce the position lock speed loop KP. ◆ The speed loop proportional gain is excessive or integral time is insufficient. Decrease the proportional gain or increase the integral time properly. ◆ Check the phase sequence of the motor.	
		Subcode 12: The encoder AB signals are lost at startup.	◆ Check whether the brake has been released. ◆ Check whether AB signal cables of the encoder break. ◆ If the motor cannot be started at the slip experiment, perform the slip experiment by using the function set in F3-24.	
		Subcode 13: The encoder AB signals are lost during running.	◆ AB signals of the encoder become loss suddenly. Check whether encoder wiring is correct, whether strong interference exists, or the motor is stuck due to sudden power failure of the brake during running.	
		Subcode 19: The signals of the SIN/COS encoder are seriously interfered with during running.	◆ The encoder analog signals are seriously interfered with during motor running, or encoder signals are in poor contact. You need to check the encoder circuit.	
		Subcode 55: The signals of the SIN/COS encoder are seriously interfered with or CD signals are incorrect during motor auto-tuning.	◆ The encoder analog signals are seriously interfered with during motor auto-tuning, or encoder CD signals are in wrong sequence.	

Fault Code	Name	Possible Causes	Solution	Level
Err21	Parameters are incorrectly set.	Subcode 2: The set value of the maximum frequency is smaller than the rated motor frequency.	◆ Increase the value of F0-06 so that it is greater than the rated motor frequency.	5A
		Subcode 3: The encoder type is incorrectly set.	◆ The SIN/COS, absolute or ABZ encoder is incorrectly set to the UVW encoder. Test whether the set value of F1-00 is matched with the encoder.	
Err22	Leveling signal abnormal	Subcode 101: The leveling signal is stuck.	◆ Check whether the leveling and door zone switches work properly. ◆ Check the installation verticality and depth of the leveling plates. ◆ Check the leveling signal input points of the MCB.	1A
		Subcode 102: The leveling signal is lost.		
		Subcode 103: The leveling position deviation is too large in elevator auto-running state.	◆ Check whether the steel rope slips.	
Err23	Short circuit	Subcodes 1, 2, 3: Short circuit to ground exists.	◆ Check whether the three-phase output of the AC drive is short circuited to ground.	5A
		Subcode 4: Inter-phase short circuit exists.	◆ Check whether the three-phase output of the AC drive is short circuited between phases or to ground.	
Err24	RTC clock fault	Subcode 101: The RTC clock information of the MCB is abnormal.	◆ Replace the clock battery. ◆ Replace the MCB.	3B
Err25	Storage data abnormal	Subcodes 101, 102, 103: The storage data of the MCB is abnormal.	◆ Contact the agent or the manufacturer.	4A
Err26	Earthquake signal	Subcode 101: The earthquake signal is active and the duration exceeds 2s.	◆ Subcode 101: Check that the earthquake signal is consistent with the parameter setting (NC, NO) of the MCB.	3B
Err27	Fault of special controller	Reserved	◆ Contact the agent or Inovance.	-
Err28	Maintenance fault	Reserved	◆ Contact the agent or Inovance.	-
Err29	Shorting motor stator contactor feedback abnormal	Subcode 101: Feedback of the shorting motor stator contactor of the MCB is abnormal.	◆ Check that the signal feature (NO, NC) of the feedback contact on the contactor is correct. ◆ Check that the contactor and corresponding feedback contact act correctly. ◆ Check the coil circuit of the shorting motor stator contactor.	5A
		Subcode 102: Feedback of the shorting PMSM stator contactor of the IO expansion board is abnormal.		
Err30	Elevator position abnormal	Subcodes 101, 102: In the normal-speed running or re-leveling running mode, the running time is larger than the value of F9-02, but the leveling signal has no change.	◆ Check whether the leveling signal cables are connected reliably and whether the signal copper wires may touch the ground or be short circuited with other signal cables. ◆ Check whether the distance between two floors is too large or the re-leveling time set in F3-21 is too short, causing over long re-leveling running time.	4A
Err31	Reserved	Reserved	◆ Reserved	-

Fault Code	Name	Possible Causes	Solution	Level
Err32	Reserved	Reserved	◆ Reserved	-
Err33	Elevator speed abnormal	Subcode 101: The detected running speed during normal-speed running exceeds the limit.	◆ Check whether the parameter setting and wiring of the encoder are correct. ◆ Check the setting of motor nameplate parameters. Perform motor auto-tuning again.	5A
		Subcode 102: The speed exceeds the limit during inspection or shaft autotuning.	◆ Attempt to decrease the inspection speed or perform motor auto-tuning again.	
		Subcode 103: The speed exceeds the limit in shorting stator braking mode	◆ Check whether the shorting motor stator function is enabled. ◆ Check whether the UVW phase sequence of the motor is right.	
		Subcodes 104, 105: The speed exceeds the limit during emergency running.	◆ Check whether the emergency power capacity meets the requirements. ◆ Check whether the emergency running speed is set properly.	
		Subcode 106: The MCB speed measuring deviation is too large.	◆ Check the wiring of the encoder. ◆ Check whether SPI communication quality between the MCB and the AC drive is excellent.	
Err34	Logic fault	Logic of the MCB is abnormal.	◆ Contact the agent or Inovance to replace the MCB.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err35	Shaft auto-tuning data abnormal	Subcode 101: When shaft auto-tuning is started, the elevator is not at the bottom floor or the down slow-down switch is invalid,	◆ Check that the down slow-down switch is valid, and that F4-01 (Current floor) is set to the bottom floor number.	4C
		Subcode 102: The system is not in the inspection state (inspection switch not turned on)	◆ when shaft auto-tuning is performed.	
		Subcode 103: It is judged upon power-on that shaft auto-tuning is not performed.	◆ Perform shaft auto-tuning again.	
		Subcodes 104, 113, 114: In distance control mode, it is judged at running startup that shaft auto-tuning is not performed.		
		Subcode 105: The elevator running direction and the pulse change are inconsistent.	◆ Check whether the elevator running direction is consistent with the pulse change in F4-03: F4-03 increases in up direction and decreases in down direction.	
		Subcodes 106, 107, 109: The plate pulse length sensed at up/down leveling is abnormal.	◆ Check that NO/NC state of the leveling switch is set correctly. ◆ Check whether the leveling plates are inserted properly and whether there is strong power interference if the leveling switch signal blinks.	
		Subcodes 108, 110: No leveling signal is received within 45s continuous running.	◆ Check whether wiring of the leveling switch is correct. ◆ Check whether the floor distance is too large, causing running time-out. Increase the speed set in F3-11 and perform shaft auto-tuning again to ensure that learning the floors can be completed within 45s.	
		Subcodes 111, 115: The stored floor height is smaller than 50 cm.	◆ Enable the super short floor function if the floor distance is less than 50 cm. If the floor distance is normal, check installation of the leveling plate for this floor and check the switch and its wiring.	
		Subcode 112: The floor when auto-tuning is completed is not the top floor.	◆ F6-00 (Top floor of the elevator) is incorrectly set or the leveling plate is missing.	
		Subcode 116: The up and down leveling signals are in wrong sequence.	◆ Check whether the up and down leveling wiring is correct. ◆ Check whether the up and down leveling gaps are proper.	

Fault Code	Name	Possible Causes	Solution	Level
Err36	RUN contactor feedback abnormal	Subcode 101: The feedback of the RUN contactor is active, but the contactor has no output.	◆ Check whether the feedback contact of the contactor acts properly. ◆ Check the signal feature (NO, NC) of the feedback contact.	5A
		Subcode 102: The controller outputs the RUN signal but receives no RUN feedback.		
		Subcode 104: When both feedback signals of the RUN contactor are enabled, their states are inconsistent.		
		Subcode 105: The feedback of the RUN contactor is active before re-leveling is enabled.		
		Subcode 103: The current of the asynchronous motor from the acceleration segment to the constant speed segment is too small (⩽ 0.1 A).	◆ Check whether the output cables UVW of the controller are connected properly. Check whether the control circuit of the RUN contactor coil is normal.	

Fault Code	Name	Possible Causes	Solution	Level
Err37	Brake contactor feedback abnormal	Subcode 101: The output of the brake contactor is inconsistent with the feedback.	◆ Check whether the brake contactor opens and closes properly. ◆ Check that the signal feature (NO, NC) of the feedback contact on the brake contactor is set correctly. ◆ Check whether the feedback circuit of the brake contactor is normal.	5A
		Subcode 102: When both feedback signals of the brake contactor are enabled, their states are inconsistent.	◆ Check the signal feature (NO, NC) of the feedback contact on the brake contactor is set correctly. ◆ b. Check whether the states of the multi-way feedback contacts are consistent.	
		Subcode 103: The output of the brake contactor is inconsistent with the brake travel switch 1 feedback.	◆ Check whether the signal feature (NO, NC) of the brake travel switch 1/2 feedback is set correctly. ◆ b. Check whether the circuit of the brake travel switch 1/2 feedback is normal.	
		Subcode 106: The output of the brake contactor is inconsistent with the brake travel switch 2 feedback.		
		Subcode 105: The brake contactor feedback is valid before the brake contactor opens.	◆ Check whether the feedback contact of the brake contactor mal-functions.	
		Subcode 104: When both feedback signal of brake travel switch 1 are enabled, their states are inconsistent.	◆ Check whether the signal feature (NO, NC) of the brake travel switch 1/2 feedback is set correctly. ◆ b. Check whether the states of the multi-way feedback contacts are consistent.	
		Subcode 107: When both feedback signal of brake travel switch 2 are enabled, their states are inconsistent.		
		Subcode 108: The brake contactor output is inconsistent with the feedback of brake travel switch 1 on the IO expansion board.	◆ Check whether the signal feature (NO, NC) of the brake travel switch 1/2 feedback on the IO expansion board is set correctly. ◆ b. Check whether the circuit of the brake travel switch 1/2 feedback is normal.	
		Subcode 109: The brake contactor output is inconsistent with the feedback of brake travel switch 2 on the IO expansion board.		

Fault Code	Name	Possible Causes	Solution	Level
Err38	Encoder signal abnormal	Subcode 101: The pulses in F4-03 do not change within the time threshold in F1-13.	◆ Check whether the encoder is used correctly ◆ Check whether the brake works properly.	5A
		Subcode 102: F4-03 increases in down direction.	◆ Check whether the parameter setting and wiring of the encoder are correct. ◆ Check whether the system grounding and signal grounding is secure. ◆ Check the phase sequence of the motor.	
		Subcode 103: F4-03 decreases in up direction.		
		Subcode 104: The SVC is used in distance control mode.	◆ Set F0-00 (Control mode) to 1 (Closed-loop vector control) in distance control mode.	
		Subcode 105: The down limit switch acts in up direction while down slow-down switch 1 is active.	◆ Check whether the wiring of up and down limit switches is normal.	
		Subcode 106: The up limit switch acts in down direction while up slow-down switch 1 is active.		
Err39	Motor overheat	Subcode 101: The motor overheat relay input remains valid for a certain time.	◆ Check whether the parameter setting (NO, NC) is correct. ◆ Check whether the thermal protection relay socket is normal. ◆ Check whether the motor is used properly and whether it is damaged. ◆ Improve cooling conditions of the motor.	3A
Err40	Reserved	Reserved	◆ Contact the agent or Inovance.	4B
Err41	Safety circuit disconnected	Subcode 101: The safety circuit signal becomes OFF.	◆ Check the safety circuit switches and their states. ◆ Check whether the external power supply is normal. ◆ Check whether the safety circuit contactor acts properly. ◆ Confirm the signal feature (NO, NC) of the feedback contact of the safety circuit contactor.	5A
Err42	Door lock disconnected during running	Subcodes 101, 102: The door lock circuit feedback is invalid during the elevator running.	◆ Check whether the hall door lock and the car door lock are in good contact. ◆ Check whether the door lock contactor acts properly. ◆ Check the signal feature (NO, NC) of the feedback contact on the door lock contactor. ◆ Check whether the external power supply is normal.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err43	Up limit signal abnormal.	Subcode 101: The up limit switch acts when the elevator is running in the up direction.	◆ Check the signal feature (NO, NC) of the up limit switch. ◆ Check whether the up limit switch is in good contact. ◆ Check whether the limit switch is installed at a relatively low position and acts even when the elevator arrives at the terminal floor normally.	4A
Err44	Down limit signal abnormal.	Subcode 101: The down limit switch acts when the elevator is running in the down direction.	◆ Check the signal feature (NO, NC) of the down limit switch. ◆ Check whether the down limit switch is in good contact. ◆ Check whether the limit switch is installed at a relatively high position and thus acts even when the elevator arrives at the terminal floor normally.	4A
Err45	Slow-down switch abnormal	Subcode 101: The down slow-down distance is insufficient during shaft auto-tuning. Subcode 102: The up slow-down distance is insufficient during shaft auto-tuning. Subcode 103: The slow-down switch is stuck or abnormal during normal running.	◆ Check whether the up slow-down and the down slow-down are in good contact. ◆ Check the signal feature (NO, NC) of the up slow-down switch and the down slow-down switch. ◆ Ensure that the obtained slow-down distance satisfies the slow-down requirement at the elevator speed.	4B
		Subcode 106: The up and down slow-down switches 2 act improperly during shaft auto-tuning.	◆ Check whether the signal of the up and down slow-down switches 2 is in wrong sequence. ◆ Check the signal feature (NO, NC) of the up and down slow-down switches 2.	
		Subcode 107: The up and down slow-down switches 3 act improperly during shaft auto-tuning.	◆ Check whether the signal of the up and down slow-down switches 3 is in wrong sequence. ◆ Check the signal feature (NO, NC) of the up and down slow-down switches 3.	
Err46	Re-leveling abnormal	Subcode 101: The leveling signal is inactive during re-leveling.	◆ Check whether the leveling signal is normal.	2B
		Subcode 102: The re-leveling running speed exceeds 0.1 m/s.	◆ Check whether the encoder is used correctly	

Fault Code	Name	Possible Causes	Solution	Level
Err47	Shorting door lock circuit contactor abnormal.	Subcode 101: The shorting door lock circuit contactor outputs for continuous 2s, but the feedback is invalid and the door lock is disconnected. Subcode 102: The shorting door lock circuit contactor has no output, but the feedback is valid for continuous 2s. Subcode 106: The door lock feedback is detected as valid before re-leveling.	◆ Check the signal feature (NO, NC) of the feedback contact on the shorting door lock circuit contactor. ◆ Check whether the shorting door lock circuit contactor acts properly.	2B
		Subcode 103: During re-leveling or pre-open running, the output time of the shorting door lock circuit contactor is larger than 15s.	◆ Check whether the leveling and re-leveling signals are normal. ◆ Check whether the re-leveling speed is set too low.	
Err48	Door open fault	Subcode 101: The consecutive times that the door does not open to the limit reaches the setting in Fb-09.	◆ Check whether the door machine system works properly. ◆ Check whether the CTB output is normal. ◆ Check whether the door open limit signal and door lock signal are normal.	5A
Err49	Door close fault	Subcode 101: The consecutive times that the door does not close to the limit reaches the setting in Fb-09.	◆ Check whether the door machine system works properly. ◆ Check whether the CTB output is normal. ◆ Check whether the door close limit signal and door lock signal are normal.	5A
Err50	Consecutive loss of leveling signal	Subcode 101: Leveling signal stuck is detected for three consecutive times. Subcode 102: Leveling signal loss is detected for three consecutive times.	◆ Check whether the leveling and door zone switches work properly. ◆ Check the installation verticality and depth of the leveling plates. ◆ Check the leveling signal input points of the MCB. ◆ Check whether the steel rope slips.	5A
Err51	CAN communication fault	Subcode 101: Feedback data of CANbus communication with the CTB remains incorrect.	◆ . ◆ Check the power supply of the CTB. ◆ Check whether the 24 V power supply of the controller is normal. ◆ Check whether there is strong-power interference on communication.	1A
Err52	HCB communication abnormal	Subcode 101: Feedback data of Modbus communication with the HCB remains incorrect.	◆ Check the communication cable connection. ◆ Check whether the 24 V power supply of the controller is normal. ◆ Check whether the HCB addresses are repeated. ◆ Check whether there is strong-power interference on communication.	1A

Fault Code	Name	Possible Causes	Solution	Level
Err53	Door lock fault	Subcode 101: The door lock feedback signal remains active 3s after door open output, with shorting door lock circuit disabled.	◆ Check whether the door lock circuit is short circuited. ◆ Check whether the feedback contact of the door lock contactor acts properly.	5A
		Subcode 102: The states of the door lock multi-way feedback contacts are inconsistent 3s after door open output.		
		Subcode 105: The door lock 1 shorting signal remains active 3s after door open output, with shorting door lock circuit enabled.		
		Subcode 106: The door lock 2 shorting signal remains active 3s after door open output, with shorting door lock circuit enabled.		
		Subcode 104: The higher-voltage and low-voltage door lock signals are inconsistent.	◆ Check whether the higher-voltage and low-voltage door lock signals are inconsistent. If the time when the MCB receives the two signals has a deviation of above 1.5s, this fault is reported. This subcode is reset at power-off and power-on again.	
		Subcode 107: The door lock short circuit input parameter is selected, but the feedback signal is continuously disconnected or is not connected.	◆ Check whether the door lock short circuit feedback signal cable is not connected or is broken.	
Err54	Overcurrent at inspection startup	Subcode 102: The current at startup for inspection exceeds 120% of the rated current.	◆ Reduce the load. ◆ Check the phase sequence of the motor. ◆ Change Bit1 of FC-00 to 1 to cancel the start-up current detection function.	5A
Err55	Stop at another landing floor	Subcode 101: During automatic running of the elevator, the door open limit is not received within the time threshold in Fb-06.	◆ Check the door open limit signal at the present floor.	1A

Fault Code	Name	Possible Causes	Solution	Level
Err56	Door open/close signal fault	Subcode 101: The door open/ close limit signal is active in running.	◆ Check the setting of door open/close limit signal NO/NC of F5-25. ◆ Check the wiring of door open/close signal.	5A
		Subcode 102: The door close limit signal is inactive in running.		
		Subcode 103: door open limit and close limit signals are both valid		
		Subcode 104: The door close limit signal is continuously connected 3s after the door is open. This fault subcode is detected after the door lock bypass is set.	◆ Check whether the door close limit signal is always active.	
Err57	Serial peripheral interface (SPI) communication abnormal	Subcodes 101, 102: The communication of the MCB with the DSP board of the drive unit is abnormal.	◆ Check the wiring between the control board and the drive board.	5A
		Subcode 103: The MCB does not match the AC drive.	◆ Contact the agent or Inovance.	
Err58	Shaft position switches abnormal	Subcode 101: The up slow-down switch and down slow-down switch are disconnected simultaneously.	◆ Check whether the signal feature (NO, NC) of the slow-down switches and limit switches are ◆ consistent with the parameter setting of the MCB. ◆ Check whether malfunction of the slow-down switches and limit switches exists.	4B
		Subcode 102: The up limit feedback and down limit feedback are disconnected simultaneously.		
Err59	Reserved	Reserved	◆ Reserved	-
Err60	Reserved	Reserved	◆ Reserved	-
Err61	Reserved	Reserved	◆ Reserved	-
Err62	Analog input cable broken	Subcode 101: The load cell analog input cable is broken.	◆ Check whether F5-36 is set correctly. ◆ Check whether the analog input cable of the CTB or MCB is connected incorrectly or broken. ◆ Adjust the load cell switch function.	3B
Err64	External fault	Subcode 101: The external fault signal is continuously active for 2s.	◆ Check the NO/NC setting of the external fault terminal. ◆ Check the input signal state of the external fault terminal.	5A
Err65	UCMP test abnormal	This fault is reported when the UCMP function test is enabled. This fault is reported when the car moves unintendedly.	◆ Check whether the brake is fully closed and whether the car does not move unintended-ly.	5A
Err66	Braking force test abnormal	This fault is reported when the braking force test is enabled and insufficient braking force is detected.	◆ Check the brake clearance.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err67	AFE fault	Subcode 01: Overcurrent	◆ Check whether the grounding or short circuit of the AFE or AC drive exists. ◆ Check whether the controller parameters are set unreasonably. ◆ Check whether the power grid is abnormal and whether output oscillation exists. ◆ Check any internal fault of the machine. ◆ Contact Inovance.	5A
		Subcode 02: AFE overheat Subcode 04: Bus undervoltage	◆ Check whether the ambient temperature is too high. ◆ Check whether the fan is faulty and whether the air filter is clogged. ◆ Check whether the module is damaged. ◆ Test the circuit fault. Contact Inovance. ◆ Reduce the load if the load is too heavy. ◆ Check whether the bus voltage test is abnormal. Contact Inovance.	
		Subcode 06: Bus overvoltage	◆ Install a regen. resistor on the AC drive. ◆ Check whether the power grid voltage and wiring are normal. ◆ Check model matching and conditions. ◆ Contact Inovance. Check whether the circuit and the voltage loop are set reasonably.	
		Subcode 07: AFE overload	◆ Check whether the matching of the machine power is reasonable.	
		Subcode 08: Power grid overvoltage Subcode 09: undervoltage of the mains Subcode 10: overfrequency of the mains Subcode 11: underfrequency of the mains	◆ Check whether the power grid voltage is normal. ◆ Contact Inovance. Check whether the circuit is normal.	

Fault Code	Name	Possible Causes	Solution	Level
		Subcode 12: Power grid voltage asymmetric Subcode 13: Power grid voltage phase lock fault	◆ Check whether the three phases of power grid voltage are normal. ◆ Check whether input cable connection is normal. ◆ Contact Inovance. Check whether the circuit is normal.	
		Subcode 14: AFE current asymmetric Subcode 15: Pulse-by-pulse current limit fault Subcode 16: Zero sequence current fault Subcode 17: Current zero shift fault	◆ Check whether the three-phase input is normal. ◆ Check whether the load is too large. ◆ Check whether the system is short-circuited to ground. ◆ Contact Inovance. Check whether the circuit is normal.	
		Subcode 19: CAN communication abnormal Subcode 21: RS485 communication fault in parallel Subcode 201/202: CAN communication abnormal	◆ Check whether the MCB software supports AFE. ◆ Check whether F6-52 BIT2 in the MCB parameters is set reasonably. ◆ Check whether the communication cable is broken or in poor contact.	
		Subcode 23: Bus connection in wrong sequence	◆ Check bus connection and exchange the polarity.	

Fault Code	Name	Possible Causes	Solution	Level
Err69	ARD fault	Subcodes 22 and 103: ARD communication fault	◆ Check the communication cable connection. ◆ Check whether the ARD power supply is normal. ◆ Check whether the 24 V power supply of the controller is normal. ◆ Check whether there is strong-power interference on communication.	1A
		Subcodes 1 to 3 and 8: ARD overcurrent fault Subcode 10: ARD overload	◆ Check whether the load is normal. ◆ Check that the wiring is correct. ◆ Check whether the load is too large. ◆ Contact Inovance.	
		Subcodes 4 to 7: ARD battery fault	◆ Check whether the battery wire is connected correctly. ◆ Check whether the battery model is correct (48 V). ◆ The battery life is reduced. Replace the battery. ◆ The machine operates too long or the ambient temperature is too high.	
		Subcode 11: ARD bus overvoltage Subcode 12: ARD bus undervoltage Subcode 13: ARD drive unit overvoltage	◆ Check whether the battery level is within a correct range. ◆ Check whether the battery voltage is normal. ◆ Contact Inovance.	
		Subcode 16: Power grid input overvoltage	◆ Check whether the power grid voltage is normal and is incorrectly connected to 380 V. ◆ Contact Inovance.	
		Subcode 21: Relay stuck	◆ Power the control cabinet on and off again. If the E69 subcode 21 reoccurs, test the stuck situation. ◆ Test whether the main relay K4 is stuck. ◆ Test whether the drive unit relay K2 is stuck. ◆ Test whether the brake release relay K1 is stuck.	
		Subcode 21: Alarm of too low lithium battery level	◆ Test whether the lithium battery is damaged. ◆ The lithium battery is discharged excessively and must be charged.	

NOTE

- Fault Err41 is not recorded in the elevator stop state.
- Fault Err42 is reset automatically when the door lock circuit is shorted or 1s after the fault occurs in the door zone.
- If faults Err51, Err52, and E57 persist, they are recorded once every one hour.

Memo NO. __________

Date / /

8 Inspection and Maintenance

8 Inspection and Maintenance

Safety Information
Danger To Prevent Electric Shock ◆ Never perform wiring at power-on. ◆ Cut off all power supplies and wait for at least ten minutes so that the residual voltage on capacitors can discharge safely. Wait at least the required interval before power-on again. ◆ Never modify wiring, disconnect the cable, remove the optional board or replace the cooling fan while the controller is running. ◆ Make sure to connect the grounding terminal of the motor to ground. Otherwise, you will suffer electric shock when touching the motor housing. ◆ Inspection, maintenance, and repair can only be performed by qualified electrical personnel. ◆ Installation, wiring, commissioning, repairing, checking and component replacement can only be performed by personnel familiar with installation, commissioning or maintenance or by qualified electrical personnel.
Warning To Prevent Fire ◆ NEVER run the controller with the protective cover removed. ◆ The drawings in the manual are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions. ◆ Tighten all terminal screws based on the specified tightening torque. This is to prevent cable connection from overheating after becoming loose. ◆ Never misconnect the main circuit. This is to ensure that the input voltage is within the allowable range. Incorrect power voltage of the main circuit may result in a fire. ◆ Keep flammable materials far away from the controller or mount the controller on incombustible surfaces such as a metal wall.
Caution ◆ Replace the cooling fan in correct ways as specified in this manual. Ensure the correct air outlet direction of the fan. Incorrect direction will weaken the cooling effect. ◆ Never install or remove the motor while the controller is running. Failure to comply may result in electric shock and damage to the controller. ◆ Use shielded cables for control circuit wiring. ◆ Meanwhile, connect the shield to ground reliably at one end to prevent controller malfunction. ◆ Never modify the controller circuit. Failure to comply will damage the controller. ◆ Make sure to connect the controller output terminals to the motor terminals correctly. Considering the characteristics of the synchronous motor, you can perform parameter setting. ◆ Never operate the controller that has been damaged. This is to prevent further damage to external equipment.

8.1 Daily Maintenance

8.1.1 Daily Inspection Items

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the components inside the controller, which may cause potential faults or reduce
the service life of the controller. Therefore, it is necessary to carry out daily and regular
maintenance for the controller. Cycles and intervals of regular checks shall also be shortened especially in environments or situations where temperature is high, cabinet is lifted or lowered frequently, AC powers and load fluctuation exist, huge shake or impact
occurs, or dust or metal powder or corrosives such as hydrochloric acid exist.
Check the following items every day to avoid deterioration in performance or product failure. Copy this checklist and sign the "checked" column after each inspection.

Inspection Item	Inspection Points	Correction	Checked
Motor	Check whether abnormal oscillation or noise exists.	◆ Check the mechanical connection. ◆ Check the power phases of the motor. ◆ Tighten all loose screws.	
Cooling fan	Check whether the cooling fans of the controller and the motor work abnormally.	◆ Check running of the cooling fan of the controller. ◆ Check running of the cooling fan of the motor. ◆ Check whether the air filter is clogged. ◆ Check whether the ambient temperature is within the allowable range.	
Installation environment	Check whether the cabinet and cable duct are abnormal.	◆ Check whether insulation of the input and output cables of the controller is damaged. ◆ Check whether the mounting bracket is shaking. ◆ Check whether the copper bar and terminals are loose and corroded.	
Load	Check whether the controller output current exceeds the controller rating and motor rating for a certain time.	◆ Check for setting of motor parameters. ◆ Check for excessive load. ◆ Check for mechanical vibration (< 0.6 g on normal condition).	
Input voltage	Check the main power supply and the control voltage.	◆ Adjust the input voltage to the allowable range. ◆ Check for starting of heavy load.	

8.2 Periodic Inspection

8.2.1 Periodic Inspection Items

Perform periodic inspection in places where daily inspection is difficult:

- Always keep the controller clean.
- Clear away the dust especially metal powder on the surface of the controller, to prevent the dust from entering the controller.
- Clear the oil dirt from the cooling fan of the controller.

Inspection Precautions
Danger ◆ To Prevent Electric Shock. Never perform inspection at power-on. ◆ Cut off all power supplies and wait for at least ten minutes before any inspection so that the residual voltage on capacitors can discharge safely.

Inspection Item	Inspection Points	Pay attentions to the following precautions before performing commissioning:	Checked
General	◆ Check for wastes, dirt and dust on the surface of the controller.	◆ Confirm that the cabinet is powered off. ◆ Use a vacuum cleaner (rather than directly touch components) to suck up wastes and dust. ◆ Wipe the surface dirt difficult to clean with alcohol and wait until the surface becomes dry.	
Cables	◆ Check whether the power cables and connections discolor. ◆ Check whether the insulation layer is aged or cracked.	◆ Replace the cracked cable. ◆ Replace the damaged terminals.	
Peripheral devices such as electromagnetic contactor	◆ Check whether the contactor is in poor contact or whether abnormal noise exists for its operation. ◆ Check whether short circuit, water seepage, swelling or cracking occurs on any peripheral device.	◆ Replace the abnormal peripheral device.	
Air filter vent	◆ Check whether the air filter and heatsink are clogged. ◆ Check whether the fan is damaged.	◆ Clean the air filter. ◆ Replace the fan.	
Control circuit	◆ Check whether the control components are in poor contact. ◆ Check whether terminal screws are loose. ◆ Check whether insulation of control cables is cracked.	◆ Clear away the foreign matters on the surface of control cables and terminals. ◆ Replace the damaged or corroded control cables.	

8.2.2 Main Circuit Insulation Test

Before measuring the insulating resistance with megameter (500 VDC megameter recommended), disconnect the main circuit cables from the controller. Do not use the insulating resistance meter to test the insulation of the control circuit.

The high voltage test need not be performed again because it has been completed before delivery.

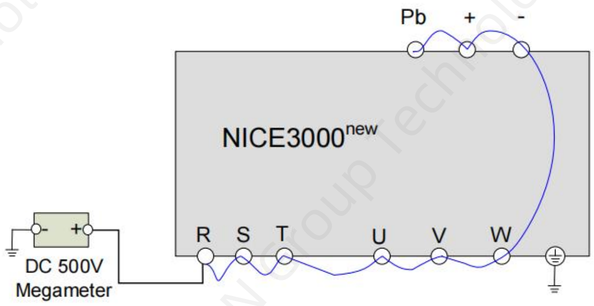


Figure 8-3 Main circuit insulation test

The measured insulating resistance must be greater than 5 MΩ.

Remove the piezoresistor screw to disconnect piezoresistor before testing.

8.3 Replacement of Vulnerable Components

8.3.1 Lifetime of Wear Parts

The cooling fan and filter electrolytic capacitor of the controller may need to be replaced after reaching their

service life. Their service life is related to the operating environment and maintenance. The service life of the two components is listed in the following table.

Component	Service Life[note]
Cooling fan	⩾ 5 years
Electrolytic Capacitor	⩾ 5 years

NOTE

◆ The lifetime is based on the following conditions. The user can decide when to replace the parts according to the uptime.

- Ambient temperature: 40°C
- Load rate: 80%
- Operation rate: 12 hours/day

8.3.2 Cooling Fan

1 Possible Cause

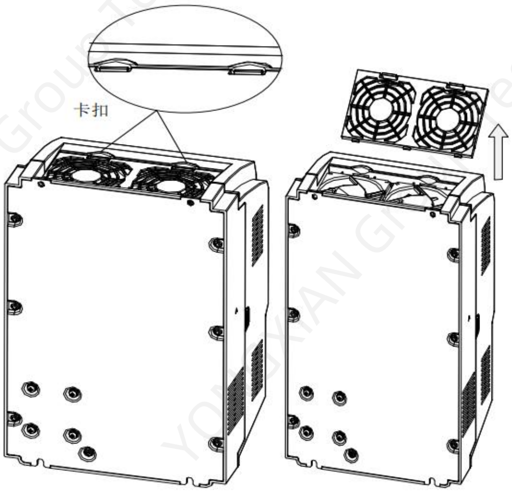
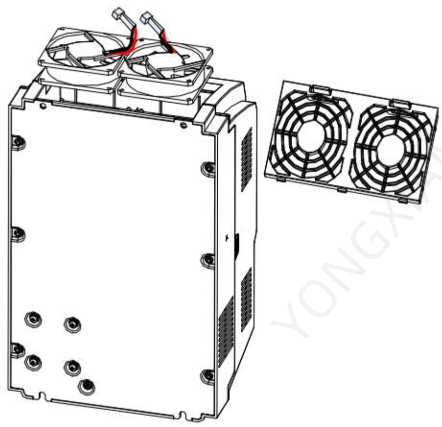
- Cooking fan bearing worn
- Blade aging

2 Judging Criteria

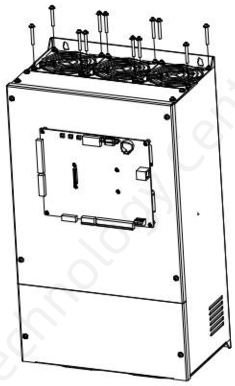
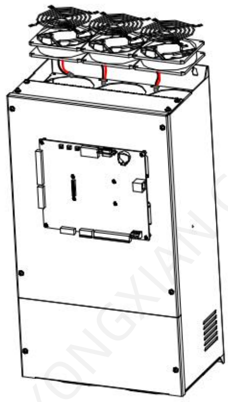
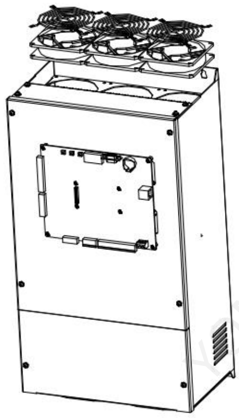
- Whether there is crack on the blade
- whether there is abnormal vibration noise upon startup
- whether the fan blades work normally

3 Replacement

Depress the hooks on the fan cover, and pull upward to remove the fan cover. Ensure the fan blows upwards after replacement.

Removing the cooling fan (plastic structure)	
1) Depress the hooks on the fan cover, and pull upward to remove the fan cover.	
2) Lift the fan a little, disconnect the fan power cables from the socket, and then remove the fan.	

Installing the cooling fan
Reverse the procedure above to reinstall the fan. 1) Connect the fan power cable to the socket. 2) Put the fan into the controller, and ensure mounting hole alignment. Pay attention to the direction arrow on the fan, and lay the fan in the specified direction to ensure upward air flow direction. 3) Press in the hooks on the fan cover into the controller, and guide the fan cover until it clicks back into place. Ensure the fan blows upwards.

Removing the cooling fan	
1) Loosen and remove the screws on the fan cover by using a screwdriver.	
2) Lift the fan cover and fan a little, and disconnect the fan power cable from the socket.	
3) Remove the fan cover and fan.	

Reattaching procedure
Reverse the procedure above to reinstall the fan. 1) Align the mounting holes on the fan with the mounting positions inside the controller. 2) Ensure correct air flow direction after reinstallment.

8.3.3 Electrolytic Capacitor

1 Possible Cause

- Input power supply in poor quality
- High ambient temperature
- Frequent load jumping
- Electrolytic aging

2 Judging Criteria

- Whether there is liquid leakage.
- Whether the safe valve has projected.
- Measure the static capacitance.
- Measure the insulating resistance.

3 Replacement

Replacement of electrolytic capacitor will influence internal components of the controller

Do not replace the electrolytic capacitor yourself. If replacement is required, contact us.

8.4 Storage

For storage of the controller, pay attention to the following two aspects:

- Pack the controller with the original packing box provided by Inovance.
- Do not put the controller in the environment of high humidity or temperature, or direct sunlight for a long time.
- Long-term storage degrades the electrolytic capacitor. Thus, the controller must be energized once every six months, each time lasting at least 5 hours. The input voltage must be increased slowly to the rated value with the regulator.

9 Description of Functions and Schemes

9.1 Attendant Function

1 Function description (Default setting of the system. Certain actions can be modified by setting the parameters)

- The elevator responds to hall calls.
- The elevator does not close the door automatically. You need to hold down the door close button to close the door. During door close, if you release the door close button, the elevator opens the door again automatically.
- In attendant state, direct travel ride and direction change can be implemented by respectively using JP20 and JP22 on the CCB. After the direction change signal is active once, the elevator will respond to the reversed direction call by changing the running direction of the next running.
- If the elevator that enters the attendant state is under parallel/group control, the hall calls of this elevator is responded to by other elevators in the parallel/group control system.

2 Wiring

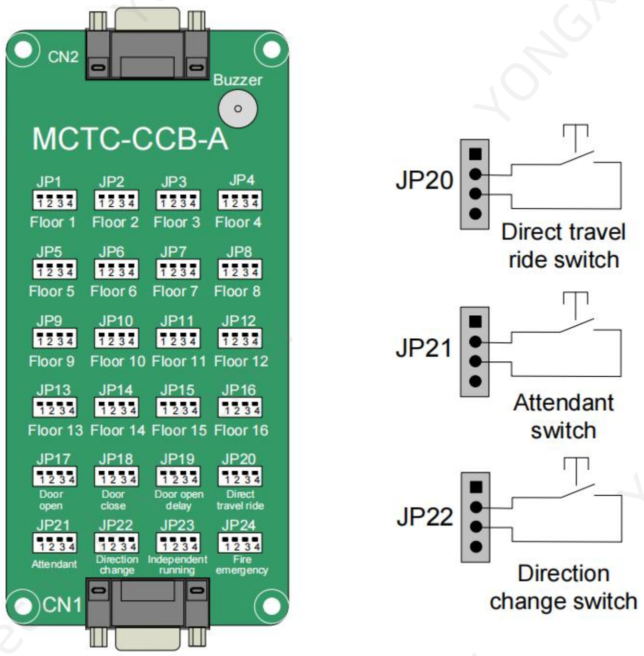


Figure 9-1 Wiring for attendant mode

After pins 2 and 3 of JP21 of the CCB is ON, the elevator enters the attendant state.

After pins 2 and 3 of JP20 of the CCB is ON, the elevator enters the direct travel ride state.

After pins 2 and 3 of JP22 of the CCB act once, the running direction of the elevator is changed once in attendant state.

3 Parameters

Function Code	Name	Setting Range	Default
F5-00	Attendant/ Automatic switchover time	3 to 200	3
F6-41	Program control selection 2	Bit10: Elevator lock in attendant state	0
F6-43	Attendant function selection	Bit0: Calls canceled after entering attendant state Bit1: Not responding to hall calls Bit2: Attendant/Automatic state switchover Bit3: Door close at jogging Bit4: Automatic door close Bit5: Buzzer tweeting at intervals in attendant state Bit6: Buzzer tweeting at intervals in attendant state Bit7: Car call button blinking to prompt	128

Attendant/Automatic switchover

If there is a hall call at non-current floor in attendant state, the system automatically

switches over to the automatic (normal) state after the time set in F5-00. After this running

is completed, the system automatically restores to the attendant state (F6-43 Bit2 must be

set to 1). When F5-00 is smaller than 5, the attendant/automatic switchover function is

disabled.

9.2 Fire Emergency Running

1 Function description (Default setting of the system. Certain actions can be modified by setting the parameters)

Returning to base floor at fire emergency

- The elevator clears car calls and hall calls automatically.
- The elevator stops at the nearest floor without opening the door, and then directly runs to the fire emergency floor.
- The elevator keeps the door open after arriving at the fire emergency floor.
- If the elevator is under parallel/group control, it exits the parallel/group control system after entering the fire emergency running state.

Firefighter operation

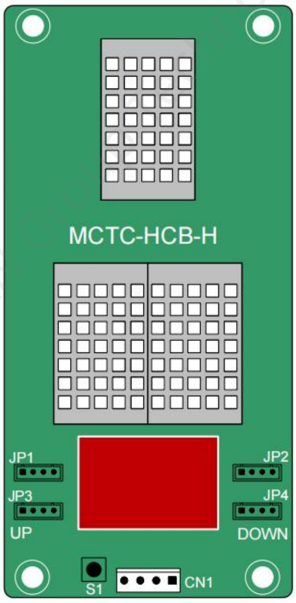
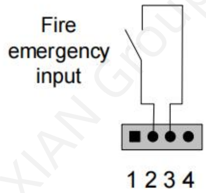
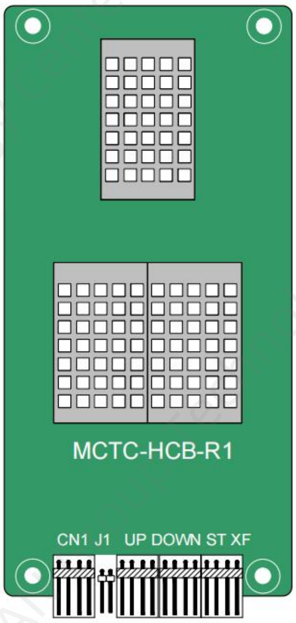
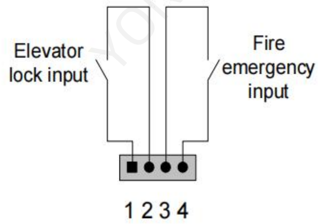
- The elevator does not respond to hall calls, and responds to only car calls. Only one call can be registered.
- The elevator does not open/close the door automatically. You need to press (jog) the door open/close button to open/close the door.
- The light curtain signal input is inactive, and safety edge signal input is active.

2 Wiring

1) State of returning to base floor at fire emergency

Scheme 1. Fire emergency input from HCB

Table 9-2 Fire emergency signal input from HCB

HCB	Terminal Name	Function	Terminal Wiring Description
 MCTC-HCB-H	JP2	Interface for the fire emergency switch Pins 2 and 3 are for switch input.	
 MCTC-HCB-R1	XF/ST	Interface for the fire emergency and elevator lock switches Pins 1 and 2 are for elevator lock input. Pins 3 and 4 are for fire emergency input.	

Scheme 2. Fire emergency input from MCB

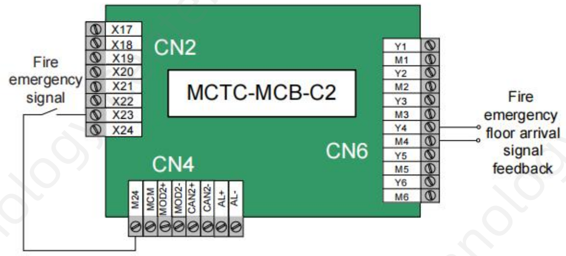


Figure 9-2 Wiring of fire emergency input signal from MCB

Function Code	Name	Setting Range
F5-23	X23 function selection	11: Fire emergency signal NO 43: Fire emergency signal NC
F5-29	Y4 function selection	Fire emergency floor arrival signal feedback

2) Firefighter operation state

Scheme 1. Entering firefighter operation via CCB input

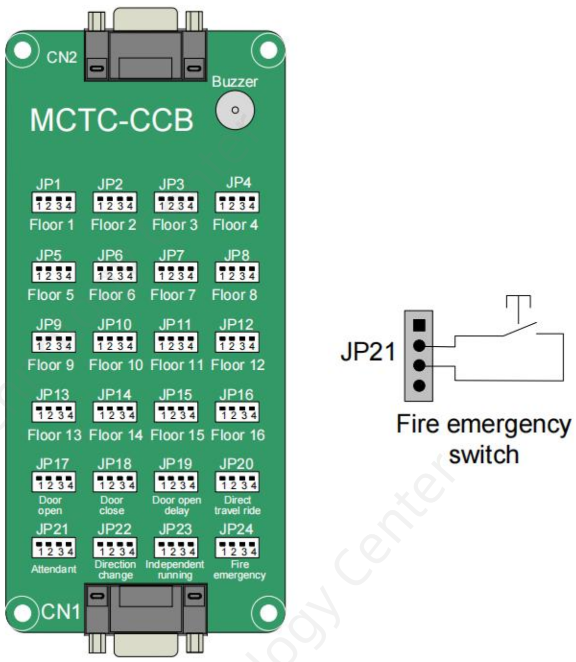


Figure 9-3 Wiring of firefighter operation signal input from CCB

Scheme 2. Entering firefighter operation state via MCB input

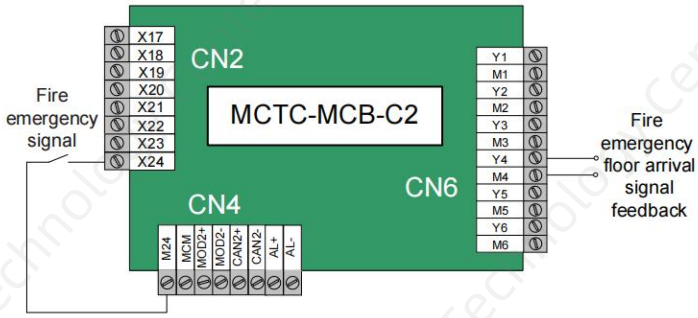


Figure 9-4 Wiring diagram of firefighter operation signal input from MCB

Function Code	Name	Setting Range
F5-24	X24 function selection	23: Firefighter running signal NO 55: Firefighter running signal NC

3 Parameters

Function Code	Name	Setting Range	Default
F6-44	Fire emergency function selection	Bit3: Arrival gong output in inspection or fire emergency state Bit4: Multiple car calls registered in fire emergency state Bit5: Retentive at power failure in fire emergency state Bit6: Closing door by holding down the door close button Bit7: Reserved Bit8: Door close at car call registering Bit9: Displaying hall calls in fire emergency state Bit10: Firefighter forced running Bit11: Exiting firefighter state upon arrival at fire emergency floor Bit12: Not clearing car calls at reverse door open in firefighter running state Bit14: Opening door by holding down the door open button Bit15: Automatic door open at fire emergency floor	16456
F5-a	Xa function selection	11/43: Fire emergency signal NO/NC	0
F5-b	Xb function selection	23/55: Firefighter running signal NO/NC	0
F5-c	Xc function selection	40/72: Fire emergency floor switchover signal NO/NC	0
F5-29	Y4 function selection	4: Fire emergency floor arrival signal feedback	0
F6-03	Fire emergency floor	0 to F6-00	0
F8-12	Fire emergency floor 2	0 to F6-00	0

■ Input setting

The fire emergency signal is input via the fire emergency switch on the HCB of any floor, and the firefighter signal is input via JP24 on the CCB. If these signals need to be input via the MCB, perform parameter setting (takes input terminals Xa and Xb as an example according to the preceding table.

The NICE3000^{new} supports switchover between two fire emergency floors, and the switch over signal is input via terminal X on the MCB (take input terminal Xc as an example).

■ Output setting

The fire emergency floor arrival signal is output via output terminal Y on the MCB (take Y4 as an example).

9.3 Elevator Lock Function

1 Function description (Default setting of the system. Certain actions can be modified by setting the parameters)

Elevator lock

- After responding to all car calls that have been registered, the elevator returns to the elevator lock floor.
- After arriving at the elevator lock floor, the elevator opens the door, and then closes the door and stops automatic running.
- After the door closes, the elevator closes the lamp and fan in the car, and cancels hall call display.

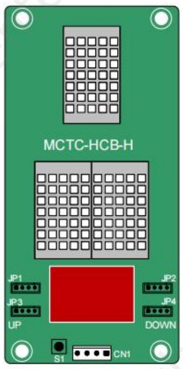
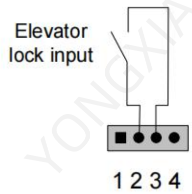
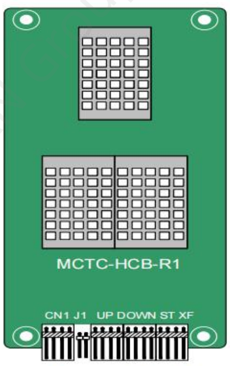
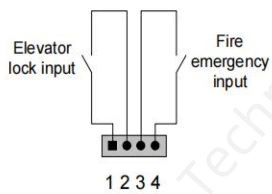
2 Wiring

- Input and setting

Generally, the elevator lock signal is input via the elevator lock switch on the HCB of any floor. If this signal needs to be input via the MCB, perform parameter setting (takes input terminal X21 as an example) according to the preceding table.

Scheme 1. Elevator lock input from HCB

Table 9-3 Elevator lock signal input from HCB

HCB	Terminal Name	Function	Connection between MCTC-PG and encoder
 MCTC-HCB-H	JP1	Interface for the elevator lock switch Pins 2 and 3 are for switch input.	
 MCTC-HCB-R1	XF/ST	Interface for the fire emergency and elevator lock switches Pins 1 and 2 are for elevator lock input. Pins 3 and 4 are for fire emergency input.	

Scheme 2. Elevator lock input from MCB

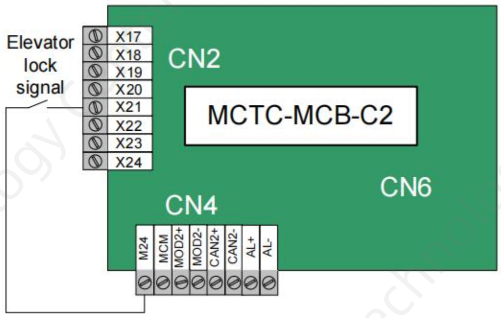


Figure 9-5 Wiring diagram of elevator lock signal input from MCB

Function Code	Name	Setting Range
F5-21	X21 function selection	28: Elevator lock signal NO 60: Elevator lock signal NC

3 Parameters

Function Code	Name	Setting Range	Default
F6-04	Elevator lock floor	F6-01 to F6-00	1
F6-38	Elevator lock start time	00.00 to 23.59	0
F6-39	Elevator lock end time	00.00 to 23.59	0
F6-40	Program control selection 1	Bit5: Timed elevator lock	0
F6-41	Program control selection 2	Bit8: Elevator lock at door open Bit9: Display available at elevator lock Bit10: Elevator lock in the attendant state	0
F6-42	Program control selection 3	Bit5: Clearing calls immediately at elevator lock	0

The input setting of the elevator lock function is as follows:

Generally, the elevator lock signal is input via the elevator lock switch on the HCB of any floor. If this signal needs to be input via the MCB, perform parameter setting (takes input terminal Xd as an example) according to the preceding table.

9.4 Full-Load/Overload Function

1 Function description

Overload:

- The buzzer tweets.
- The door cannot close, even if you press the door close button.
- The CCB displays overload indication, "OL" or "OVERLOAD".
- The full-load indication or "FL" is displayed at the hall.

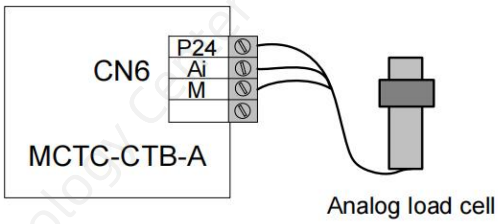
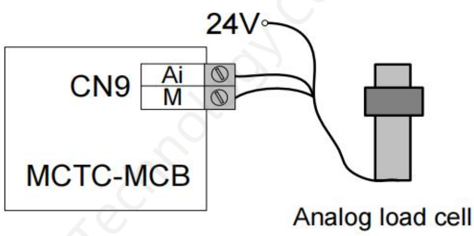
Full-load:

- The full-load indication or "FL" is displayed at the hall.
- Elevator car calls operate normally.
- The elevator supports registration of hall calls but not respond to them.

The elevator full-load/overload switches are classified into two types: analog and digital. The following part separately describes the parameter setting of the two types.

2 Wiring

Wiring and parameter setting of analog full-load/overload switches

Type	Wiring Diagram	Parameter Setting
Connected to CTB	Terminals P24 and M are connected to positive and negative of the power cable, and terminal Ai are connected to the signal cable of the analog load cell.  	F5-36 = 2 (CTB analog input)
Connected to MCB	Terminal 24 V of the system is connected to power cable positive of the analog load cell, and terminal M of CN9 on the MCB is connected to power cable negative of the analog load cell. Terminal Ai of CN9 on the MCB is connected to the signal cable of the analog load cell.  	F5-36 = 3 (CTB analog input)

When the analog load cell is used, load cell auto-tuning must be performed; otherwise, the analog load cell cannot be used. Perform analog load cell auto-tuning to obtain the car full-load/overload data according to the following flowchart.

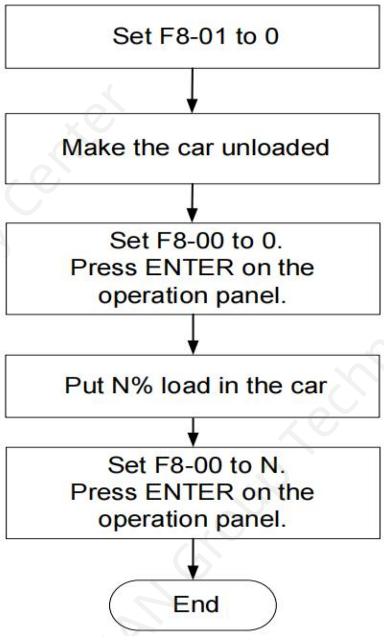


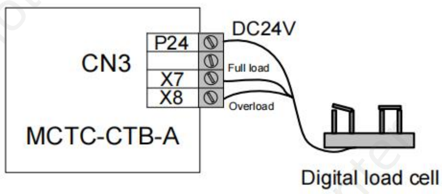
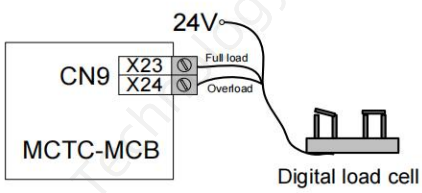
Figure 9-6 Analog load cell auto-tuning flowchart

F8-06 and F8-07 respectively record the obtained no-load and full-load data after the load cell auto-tuning is successful. You can also monitor the current load condition in the car by viewing F8-05. When the current load exceeds 110% of the rated load, the system reports overload warning.

NOTE

◆ Note that F8-05 to F8-07 record the binary data indicating the car load condition rather than the ratio of actual car data to the rated car load.

Wiring and parameter setting of digital full-load/overload switches

Type	Wiring Diagram	Parameter Setting
Connected to CTB	The full-load signal and overload signal must be respectively connected to X7 and X8. 	F5-36 = 1
Connected to MCB	This figure takes X23 and X24 inputs only as an example. 	F5-36 = 0 (CTB analog input)

3 Parameters

The parameters involved in analog load cell auto-tuning are described in the following table.

Function Code	Name	Setting Range	Description
F8-00	Load for load cell auto-tuning	0 to 100	Set the load ratio of the car properly during analog load cell auto-tuning.
F8-01	Pre-torque selection	0: Pre-torque invalid 1: Load cell pre-torque compensation 2: Automatic pre-torque compensation 3: Load cell pre-torque and automatic compensation both in effect	Set this parameter to 0 before starting analog load cell auto-tuning.
F8-05	Current car load	0 to 1023	It displays the current load condition in the car.
F8-06	Car no-load load	0 to 1023	It records the obtained no-load condition.
F8-07	Car full-load load	0 to 1023	It records the obtained full-load condition.

Commissioning of digital full-load/overload switches

Type	Function Code	Name	Setting Range	Value
Input type setting	F5-36	Load cell input selection	0: MCB digital input 1: CTB digital input	0
MCB input	F5-e	Xe function selection	0 to 195	14/46: Overload signal NO/NC
	F5-f	Xf function selection	0 to 199	15/47: Overload signal NO/NC
	F5-g	Xg function selection	0 to 199	38/60: Light-load signal NO/NC
CTB Input	F5-25 Bit6	Full-load signal NO/NC	0 to 511	Bit6 = 1 (Default: NO)
	F5-25 Bit7	Overload signal NO/NC	0 to 511	Bit7 = 0 (Default: NC)

Monitoring of Full-Load/Overload Signal State

You can view F5-35 on the operation panel to see whether the full-load signal or the overload signal is active.

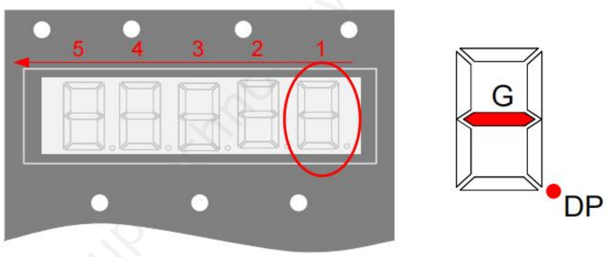


Figure 9-7 Monitoring of full-load/overload signals in F5-35

9.5 Time-based Floor Service

1 Function description

This function provides services for specified floors at certain time periods.

2 Parameters

Function Code	Name	Setting Range	Default
FE-32	Elevator function selection 1	Bit8: Time-based service floor function	0
F6-18	Start time of time-based floor service 1	00.00 to 23.59	00.00
F6-19	End time of time-based floor service 1	00.00 to 23.59	00.00
F6-20	Service floor 1 of time-based floor service 1	0 to 65535	65535
F6-21	Service floor 2 of time-based floor service 1	0 to 65535	65535
F6-36	Service floor 3 of time-based floor service 1	0 to 65535	65535
F6-22	Start time of time-based floor service 2	00.00 to 23.59	00.00
F6-23	End time of time-based floor service 2	00.00 to 23.59	00.00
F6-24	Service floor 1 of time-based floor service 2	0 to 65535	65535
F6-25	Service floor 2 of time-based floor service 2	0 to 65535	65535
F6-27	Service floor 3 of time-based floor service 2	0 to 65535	65535

F6-18 to F6-25 set the time range and service

floors of two groups of time-based floor services.

In non-time-based floor service time period, the elevator responds to the service floors set by F6-05, F6-06, and F6-35. Where,

- Service floor 1 corresponds to floors 1–16.
- Service floor 2 corresponds to floors 17–32.
- Service floor 3 corresponds to floors 33–40.

For example, in the time period of time-based floor service 1 (set by F6-18 and F6-19), the elevator responds to the service floors set by F6-20, F6-21, and F6-36 but ignores the service floors set by F6-05, F6-06, and F6-35.

The setting of time-based service floors is the same as that of service floors in F6-05.

9.6 Running Test

1 Function description

The running test parameters are set to facilitate elevator commissioning and maintenance, involving:

- Car call test
- Random running test
- Running test with disabling certain functions (hall call, door open, overload, limit)

Before the running test at normal speed, check that the shaft is unobstructed, and the safety circuit, door lock circuit and shaft switches are all normal.

2 Parameters

Group F7 parameters for MCB test

Function Code	Name	Setting Range	Default
F7-00	Car call floor registered	0 to F6-00	0
F7-01	Up call floor registered	0 to F6-00	0
F7-02	Down call floor registered	0 to F6-00	0
F7-03	Random running times	0 to 60000	0
F7-04	Hall call forbidden	0: No 1: Yes	0
F7-05	Door open forbidden	0: No 1: Yes	0
F7-06	Overload function	0: Disabled 1: Enabled	0
F7-07	Limit function	0: Enabled 1: Disabled	0

Example Description of parameter setting

F7-00 = 6, F7-01 = 3, F7-02 = 5. The car call registered is floor 6, up call registered floor 3, and down call registered floor 5. After the test parameters are set, the calls remain valid, and will become invalid after they are changed to 0 or the system is powered off completed.

Set F-8 on the keypad, and "E88" is displayed.

- F-1: command input of the running floor

After you enter the F1 menu, the 7-segment LEDs display the bottom floor (F6-01). You can press the UP button to set the destination floor within the range of lowest to top and then press the SET button to save the setting. The elevator runs to the destination floor, and the display switches over to the F-0 menu at the same time.

- F-8: test function

After you enter the F-8 menu, the 7-segment LEDs display "0". The setting of F-8 is described as follows:

1	Hall call forbidden
2	Door open forbidden
3	Overload forbidden
4	Limit switches disabled
6	Entering slip experiment state
7	Manual test on UCMP
8	Manual test on braking force

After the setting is complete, press the SET button. Then the 7-segment LEDs display "E88" and blink, prompting that the elevator is being tested. When you press PRG to exit, F8 is back to 0 automatically.

9.7 Anti-nuisance Function

1 Function description

The system automatically judges the number of passengers inside the car and car call registers. If there are excessive car calls, the system determines that it is in nuisance state, and cancels all car calls. Then, car calls need to be registered again correctly.

There are three judging methods:

- Nuisance judged by load cell. A load cell is required. The system determines that nuisance exists when the number of car calls exceeds the number of passengers in the car plus 3. Every passenger is calculated by 70 kg.
- Nuisance judged by light curtain. The system determines that nuisance exists when the light curtain does not act after the elevator stops at arrival for three consecutive times.
- Nuisance judged by light-load signal. If the light-load signal is active, the system determines that nuisance exists when the number of car calls is greater than 3.

2 Parameters

Function Code	Name	Setting Range	Default
F0-05	Rated elevator load	300 to 9999	1000
F8-08	Anti-nuisance function	0: Anti-nuisance function disabled 1: Nuisance judged by load cell 2: Nuisance judged by light curtain 4: Nuisance judged by light-load signal	0

The rated load is used in the anti-nuisance function.

When F8-08 = 4, the light load switch is used for judging nuisance. Below 30% of the rated low is considered as light load.

9.8 Disability function

1 Function description

This function allows the disabled people to use the elevator conveniently, and is implemented through the disability operation box and hall call box.

- If there is a call at this floor from the disability operation box, the door open holding time is prolonged.
- It is the same for the back door.
- If there is a call from the disability hall call box, the door open holding time is prolonged.

2 Wiring

Disability operation box inside the car

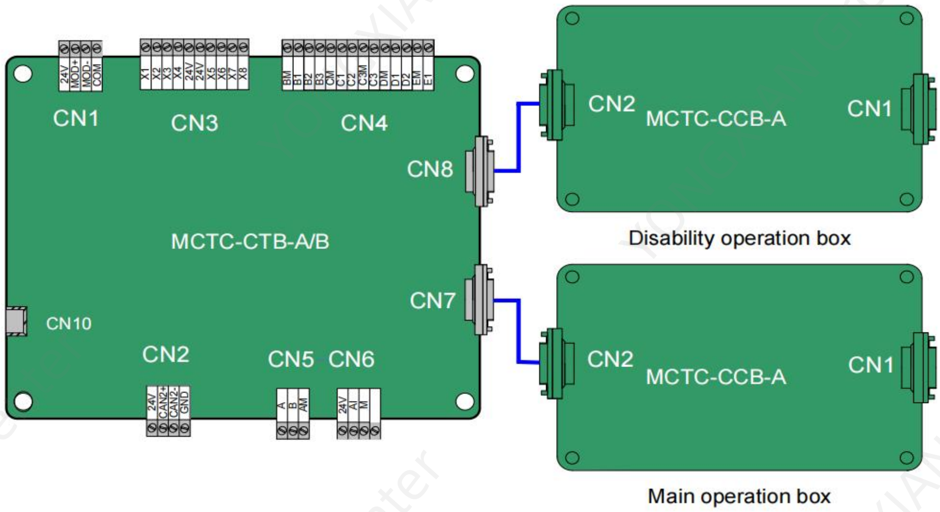


Figure 9-8 Wiring diagram 1 of disability operation box

CN8 as the interface for connecting the disability operation box (F6-40 Bit12 = 1)

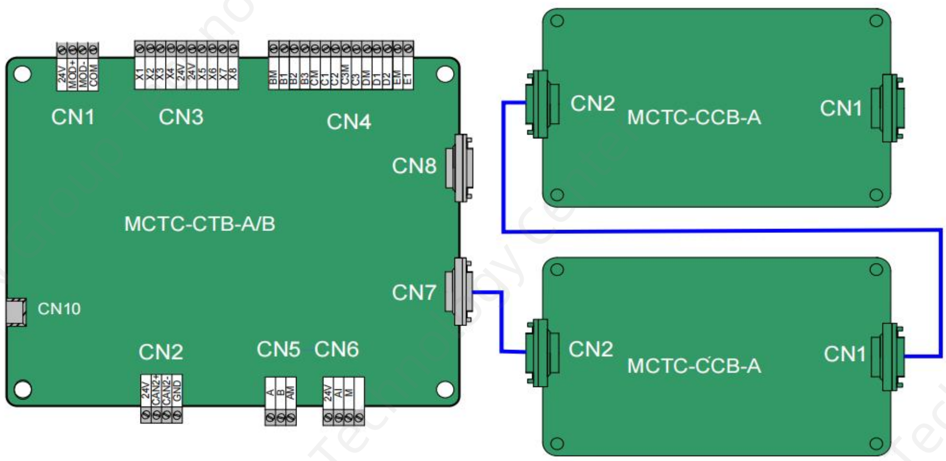


Figure 9-9 Wiring diagram 2 of disability operation box

CCB2 cascaded as the interface for connecting the disability operation box (F6-40 Bit13, Bit14 = 1)

Disability function enabled by HCB-B

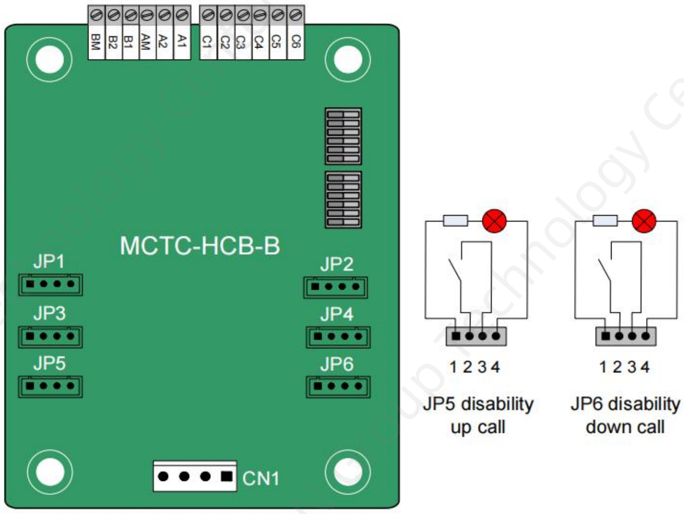


Figure 9-10 Wiring diagram of disability function enabled by HCB-B

3 Parameters

Function Code	Name	Setting Range	Default
F6-40	Program control selection 1	Bit0: Disability function Bit12: Car call assisted command in single door used as disability function Bit13: Folding command used as disability function and back door function Bit14: Car call command folding	0
Fb-15	Special door open holding time	10 to 1000	30

The functions defined by the binary bits of F6-40 are described in the following table.

Bit	Function	Description
Bit0	Disability function	It is used to enable or disable the disability function.
Bit12	Car call assisted command in single door used as disability function	You can set the auxiliary command terminal (CN8) on the CTB for input of the disability calls (folding command not required).
Bit13	Folding command used as disability function and back door function	It is used to set the the use of folding command. It is valid only when the function of Bit14 is enabled. 1: Disability 0: Back door
Bit14	Car call command folding	Car call command folding: A. Function disabled: CN7 is used for front door calls or ordinary calls, and CN8 is used for back door calls or disability calls. B. Function enabled: For CN7 and CN8, inputs 1 to 16 are used for front door calls or ordinary calls, and inputs 17 to 32 are used for back door calls or disability calls.

FB-15 is used to set the door open holding time when there is a disability call

9.9 VIP Running Function

1 Function description

After the VIP function is enabled, the elevator first directly runs to the VIP floor and provides services for VIP persons.

- After entering the VIP state, the elevator clears current hall calls, and does not respond to hall calls; door open or close needs to be controlled manually.
- The elevator does not close the door automatically. You need to hold down the door close button to close the door. During door close, if you release the door close button, the elevator opens the door again automatically.
- The VIP running times is set in F6-46 Bit8.
- F6-46 Bit8 = 0: The number of car calls is not limited. The elevator automatically exits the VIP state in one of the following conditions:

  It does not enter the car call running within 30s after each time stop. It has executed all car calls.

  There is no car call 30s after the elevator enters the VIP state.

2 Wiring

VIP enabled by hall call at VIP floor

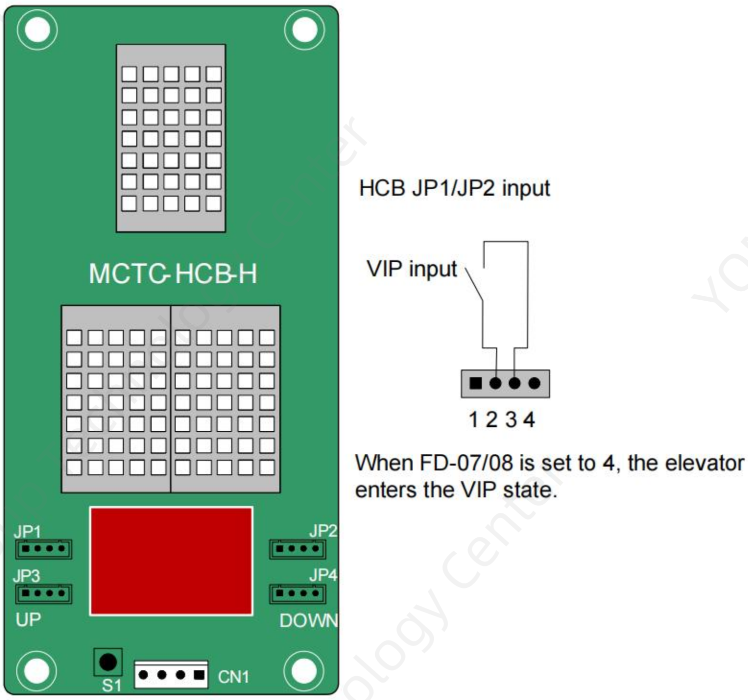


Figure 9-11 Wiring diagram of VIP enabled by HCB

3 Parameters

Function Code	Name	Setting Range	Default
F6-12	VIP floor	0 to F6-00	8
F6-59	Elevator function selection 1	Bit9: VIP function	Bit9 = 1
F6-46	VIP function selection	Bit0: VIP enabled by hall call (at VIP floor) Bit1: VIP enabled by terminal Bit8: Number of VIP car calls limited	0

Example Using VIP service and setting VIP floor

1) Parameter setting (for example, set floor 8 among 20 floors as the VIP floors)

Function Code	Name	Setting Range	Value	Remarks
F6-00	Top floor of the elevator	F6-01 to 40	20	These two parameters are used to set the top floor and bottom floor of the elevator, determined by the number of actually installed leveling plates.
F6-01	Bottom floor of the elevator	1 to F6-00	1	
F6-12	VIP floor	0 to F6-00	8	Set the 8th floor as the VIP floor.
FE-32	Elevator function selection 1	Bit9: VIP function	Bit9 = 1	The VIP function is enabled.
F6-46	VIP function selection	Bit8: Number of VIP car calls limited	-	Bit8 = 1: The elevator responds to only one car call (the last one). Bit8 = 0: The number of car calls is not limited.

2) Method of enabling VIP

VIP enabled by hall call at VIP floor: The elevator enters the VIP state only when there is a hall call (input by the up/down hall call button) at the VIP floor. F6-46 Bit0 needs to be set.

Function Code	Name	Setting Range	Value	Remarks
F6-46	VIP function selection	Bit0: VIP enabled by hall call at VIP floor	Bit0 = 1	When there is a hall call at the VIP floor, the elevator enters the VIP state.

VIP enabled by terminal: The elevator enters the VIP state when the terminal for VIP hall call becomes ON. In this mode, when the terminal for VIP hall call becomes ON, the elevator directly runs to the VIP floor, automatically opens the door and wait for passengers. F6-46 Bit0 needs to be set.

Function Code	Name	Setting Range	Value	Remarks
FD-07	HCB: JP1 input	NO input: 1: Elevator lock signal 2: Fire emergency signal 3: Present floor forbidden 4: VIP floor signal 5: Security floor signal 6: Door close button input	FD-07 = 4	1. These parameters are used to set the functions of JP1 and JP2 on the HCB. 2. The setting is effective to the HCBs for all floors. 3. You can use either of JP1 and JP2 for VIP input.
FD-08	HCB: JP2 input		FD-08 = 4	
F6-46	VIP function selection	Bit1: VIP enabled by terminal	Bit1 = 1	After the terminal for VIP hall call becomes ON, the system enters VIP running.

9.10 UCMP Function

1 Function description (Default setting of the system. Certain actions can be modified by setting the parameters)

The elevator car landing at a certain floor may move unexpectedly, with floor door unlocked and car door open, if the motor or any component of the drive control system fails. A device is required to prevent or stop the movement, guaranteeing safety.

NOTE

◆ Pre-open modules (MCTC-SCB-A/A1/C) are required for the UCMP function.

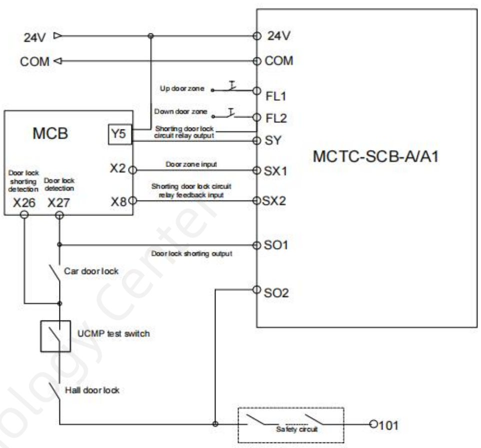
Table 9-4 Selection of test components

Item	Synchronous Motor	Asynchronous Motor
	Without Any Auxiliary Brake	Without an Auxiliary Brake
Model	MCTC-SCB-A or MCTC-SCB-A1	MCTC-SCB-D ①

① Only MCTC-SCB-D can be used for the opposite door on site.

2 Wiring

Without any additional brake (single door)



Recommended installation scheme for Monarch UCMP switch

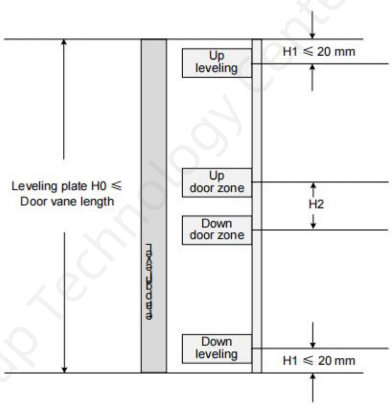
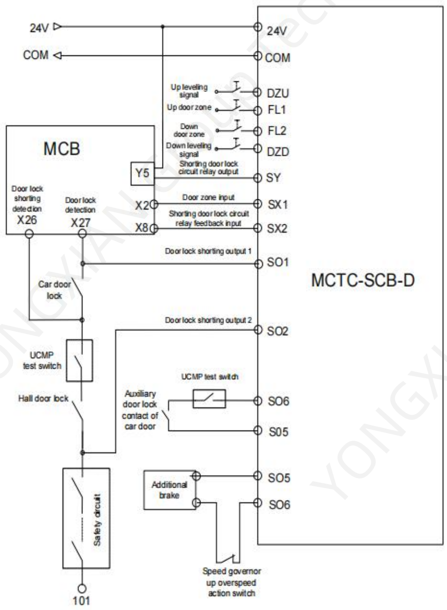


Figure 9-12 UCMP wiring without any additional brake

Requirements for switch installation:

- H1 ≤ 20 mm; H2 = 60 mm.
- Leveling plate length ≤ 300 mm. A 300 mm leveling plate is recommended.
- Two door zone switches must be used. The leveling plate length is determined by the actual door open zone (door vane length) of the elevator.
- NO door zone switches must be used.

With an auxiliary brake (single door)



With an auxiliary brake (double door)

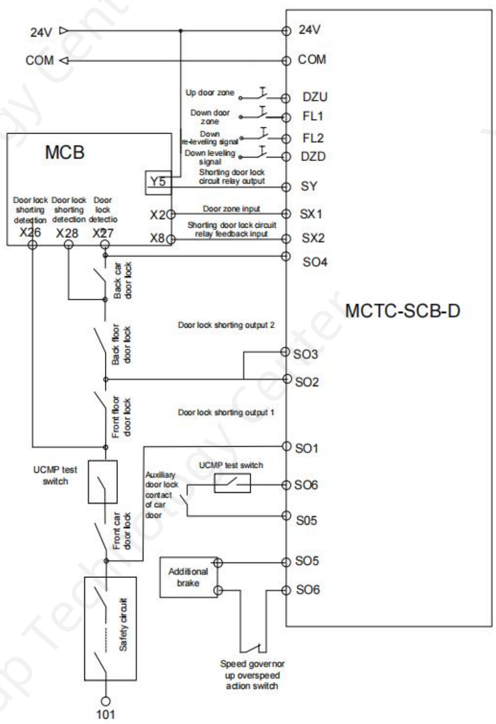


Figure 9-13 UCMP wiring with an additional brake

3 Parameters

Function Code	Name	Setting Range
F-8	Test function	7: Entering the UCMP test with the keypad
F3-24	Program function selection	0: Reserved 1: Slip experiment function enabled 2: UCMP manual test

Function Code	Name	Parameter Setting
F5-01	X1 function selection	01/33: Up leveling signal NO/NC (MCTC-SCB-A/A1)
		01: Up leveling signal NO (MCTC-SCB-D)
F5-03	X3 function selection	02/34: Down leveling signal NO/NC (MCTC-SCB-A/A1)
		02: Down leveling signal NO (MCTC-SCB-D)
F5-02	X2 function selection	03: Door zone signal NO
F5-08	X8 function selection	22: Shorting door lock circuit contactor feedback NO
F5-30	Y5 function selection	03: Shorting door lock circuit contactor control

Test method:

1) In inspection state, in the case of door lock closed, and in the door zone.
2) Set F-8 to 7 (or F3-24 to 2 using the keypad, and the system displays E88 and enters the UCMP test function. At this moment, the door lock circuit is open.
3) Manually press and hold down the inspection button and the up or down button, and the shorting motor stator contactor performs outputting and the door lock is shorted. At this moment, the elevator performs inspection running.
4) After the elevator is divorced from the door zone (the door zone signal is invalid), the hardware UCMP module will cancel door lock shorting. At this moment, the elevator reports E65 (UCMP fault) and stops running.

NOTE

- It is invalid to set F-8 to 7 and F3-24 to 2 in non-inspection state or door zone or in the case of door lock inoperative.
- After F-8 is set to 7 or F3-24 is set to 2, clearing is automatically performed after one running and after power failure.
- In UCMP test mode, the startup acceleration curve is linearly accelerated to the inspection speed according to F3-08.
- Automatic resetting cannot be performed in case of E65 or after power-off and on.
- E65 can be manually reset only in inspection state.

9.11 Braking Force Test Function

1 Function description (Default setting of the system. Certain actions can be modified by setting the parameters)

To prevent failure of the brake contactor of the motor that guarantees safe running, periodically test whether the braking force of the brake contactor meets the requirements and detect the braking force of the control system.

2 Wiring

Wiring is not required.

3 Parameters

Function Code	Function description	Setting Range	Default	Remarks
F2-32	Torque output duration	1 to 10s	5	When it is set to 0, the system uses the default value 5.
F2-33	Torque limit	1 to 150% of the rated motor torque	110	When it is set to 0, the system uses the default value 110% of rated motor torque.
F2-34	Threshold of pulses for judging braking force abnormal	1 to 100 encoder feedback pulses	0	When it is set to 0, the system uses the default value 30.
F2-35	Threshold of slip distance excessive	1° to 20° motor rotating mechanical angle	0	When it is set to 0, the system uses the default value 5° for the synchronous motor and 10° for the asynchronous motor.
F-8	Test function	8: Manual test on braking force	0	The braking force test is enabled with the keypad.
F7-09	Braking force test result	0 to 2	0	/
F7-10	Braking force test countdown	0 to 1440	1440	Countdown time is automatically restored to 1440 at the end of the test.

Manual test:

1) The system is in inspection state and the inspection switch is active;
2) The elevator stops in door zone and keeps door closed.
3) Triggering with the keypad: F-8 is set to 8;
4) When the system enters the test state, the MCB displays E88;
5) The shorting motor stator contactor and RUN contactor have output, and the brake contactor has no output.
6) The system starts testing according to the output torque related to the braking force.
7) E88 disappears on the MCB. F7-09 is displayed at the end of the test. In the case of F7-09 = 2, E66 (braking force unqualified) is reported immediately, the elevator stops running, and the fault cannot be reset.

Automatic test:

After braking force test conditions ① are satisfied, the system automatically enters the test state. The steps are the same as steps 4, 5, 6, and 7 of the manual test.

Fault E66 cannot be reset upon power failure and can be automatically reset only when a braking force test is redone and passes.

NOTE

- Countdown function: After 12 h is exceeded, the system starts to judge whether condition 1 is satisfied. If testing has been performed, the countdown function code is reset to 24 h. If no test has been performed, the system proceeds to condition 2 (forced test).
- During the automatic test, no fault is prompted for hall calls and the keypad prompts the E88 test state. Hall calls can be registered, but cannot obtain a response. The system restores to normal and responds to registered hall calls at the end of the test. Car calls are canceled. The door cannot be opened or closed.

① Test conditions

- Condition 1: Normal test on braking force: Under the condition of no car and hall calls, testing is performed after the elevator energy saving time or 3 minutes.
- Condition 2: Forced test on braking force: The system makes a judgment ahead of 10 minutes. When time set in F7-10 is smaller than or equal to 10 minutes, the elevator buzzes for 30s. Buzzing can be closed by setting F8-19 Bit13. At the moment, registered hall calls are reserved, car calls are canceled, and the door can be opened or closed. The system starts testing after the door is closed.

9.12 Shorting PMSM Stator Scheme

1 Background

Shorting PMSM stator means shorting phases UVW of the PMSM, which produces resistance to restrict movement of the elevator car. This prevents car slip during brake failure and ensures safety.

2 Overview

An independent contactor for shorting PMSM stator is installed. On the coil circuit of the RUN contactor, an NO contact of the shorting PMSM stator contactor is connected in serial, to ensure that output short circuit does not occur when the parameter setting is incorrect.

Scheme 1: for AC shorting

Scheme 2: for DC shorting

9.12.1 Scheme 1

1 Wiring

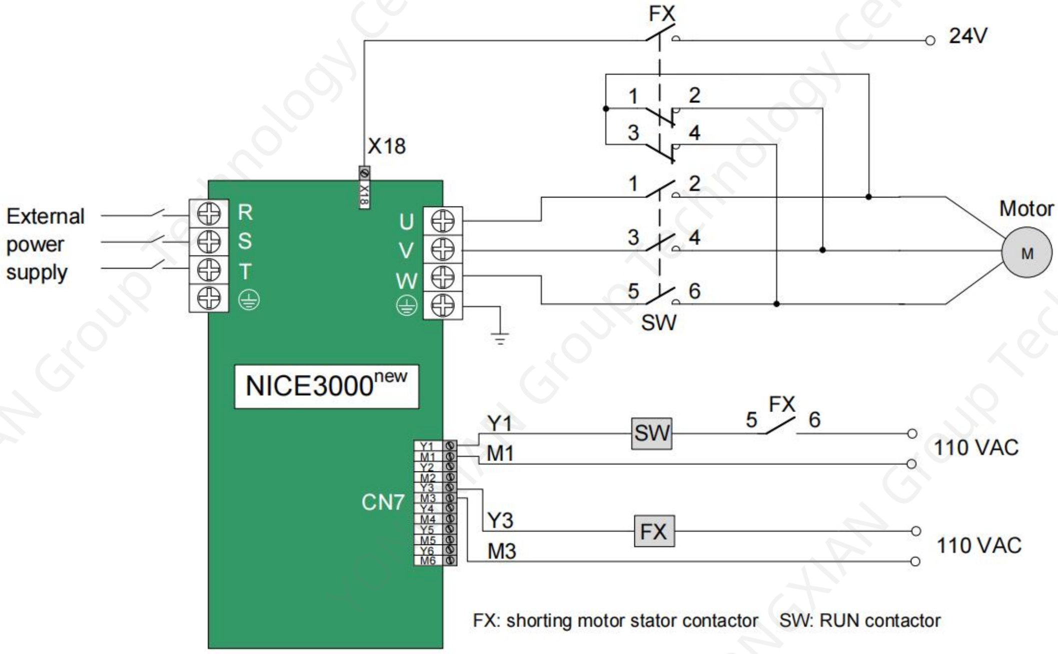


Figure 9-14 Wiring of the independent shorting PMSM stator contactor

2 Parameters

The parameter setting in shorting PMSM stator mode is described in the following table.

Function Code	Name	Value	Description
F5-18	X18 function selection	30	Allocate X18 with "Input of shorting PMSM stator feedback signal".
F5-28	Y3 function selection	3	Allocate Y3 with "Output of shorting PMSM stator contactor feedback signal".
FE-33	Elevator function selection 2	-	Bit8 = 0: NC output contactor Bit8 = 1: NO output contactor

9.12.2 Scheme 2

1 Wiring

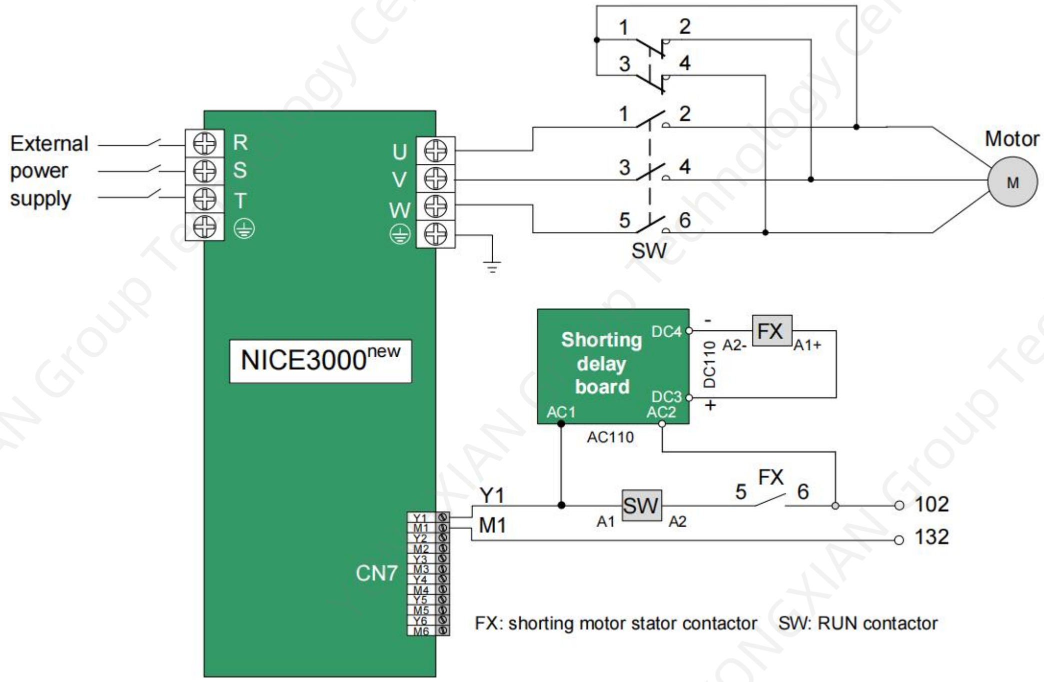


Figure 9-15 Wiring diagram of shorting delay board

2 Parameters

No parameter is needed. During running output, the AC110 and DC110 on the delay board is live. Then, the FX shorting contactor is closed and auxiliary contact 5.6 is actuated, and in turn, the SW run contactor is closed. The elevator starts to run. When the elevator stops, the SW run contactor is opened, and the FX contactor is opened after a delay of 1–2s caused by the delay board. That is how shorting delay is achieved.

9.13 Automatic Emergency Evacuation Scheme at Power Failure

1 Background

Passengers may be trapped in the car if power failure happens during use of the elevator. The emergency evacuation device needs to be configured in the system to solve the problem.

2 Overview

Scheme 1: UPS standby power supply (220 V)

In this scheme, the 220 V UPS provides power supply to the motor and the drive control circuit.

Scheme 2: Automatic rescue device (ARD) for elevator emergency evacuation

In this scheme, the ARD provides power supply to the motor and the drive control circuit.

The elevator ARD has its own control system. The ARDs of different brands may have different control and output wiring; during use, refer to the corresponding user manual for the ARD. This part describes only Monarch elevator ARD.

Automatic Emergency Evacuation Scheme	Principle
Emergency evacuation by controller drive	After the mains power supply shuts down, the standby power supply is used to provide power to the system. The controller drives the motor, which runs the car to the leveling area to let passengers out.
Emergency evacuation by shorting stator braking	After the mains power supply shuts down, the standby power supply is used to provide power to the system. The controller shorts the motor stator and releases the brake, making the car move slowly under the effect of the weighing difference between the car and the counterweight to the leveling area to let passengers out.

There are two standby power supply modes in the industry.

Standby Power Supply	Description
Emergency evacuation by controller drive	The (UPS) is used. The UPS RUN contactor and UPS control circuit must added in the control cabinet.
Automatic rescue device (ARD) for elevator emergency evacuation	The battery is used as the standby power supply. Only the input terminal for emergency evacuation signal feedback must be reserved in the control cabinet. There is no other cost. The ARD itself has the control system which can diagnose the mains power supply status and performs emergency evacuation running.

9.13.1 220 V UPS

1 Wiring

The following figure shows the emergency 220 V UPS circuit.

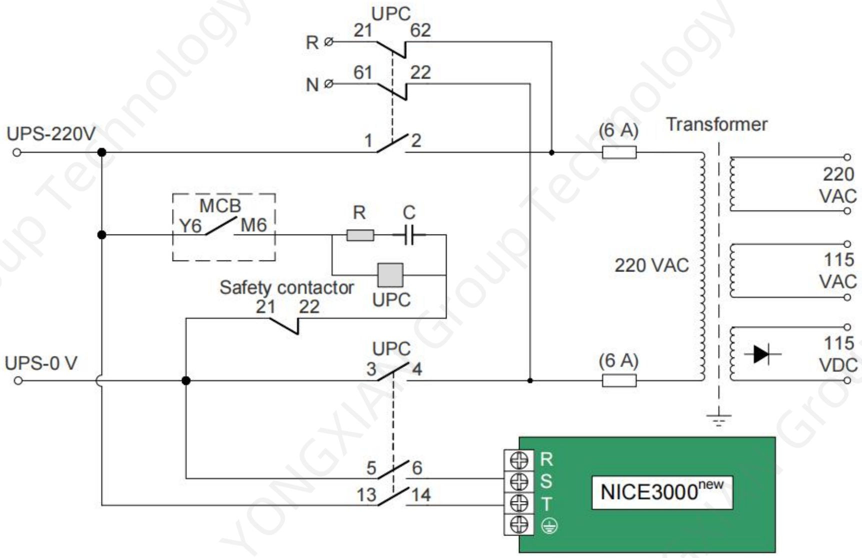


Figure 9-16 220 V UPS circuit

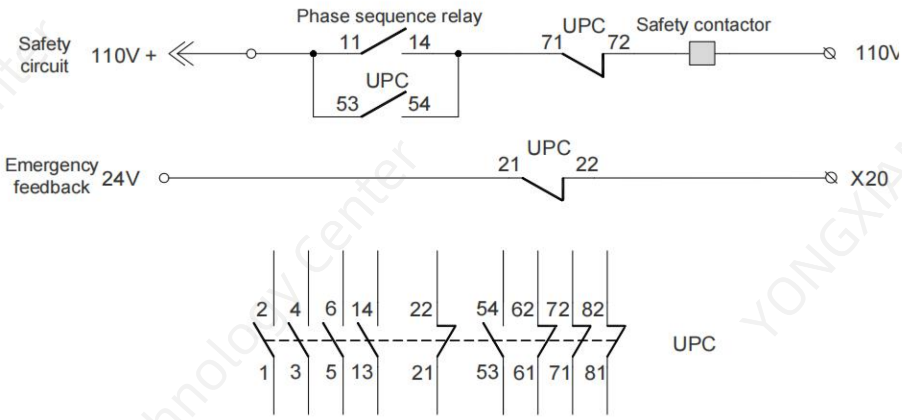


Figure 9-17 Various contacts of the contactors

2 Parameters

The parameter setting related to emergency evacuation by controller drive is described in the following table.

Function Code	Value	Description	Remarks
F8-10	1: UPS	Emergency evacuation operation mode at power failure	-
F5-20 (X20)	59	Emergency evacuation signal NC	Assume that X20 is used as the NC input of emergency evacuation signal
F5-31 (Y6)	13	Emergency evacuation automatic switchover	Only Y6 can be used for emergency evacuation output.

The parameter setting related to emergency evacuation by shorting stator braking is described in the following table.

Function Code	Value	Description	Remarks
F8-10	0: Motor not running	Emergency evacuation operation mode at power failure	-
F5-20 (X20)	59	Emergency evacuation signal NC	Assume that X20 is used as the NC input of emergency evacuation signal
F5-31 (Y6)	13	Emergency evacuation automatic switchover	Only Y6 can be used for emergency evacuation output.
F6-45	Bit15 = 1	Enabled	-

The UPS capacity recommended for the power rating is listed in the following table.

Table 9-5 The UPS capacity recommended for the power rating is listed in the following table.

UPS Power	Controller Power
1 kVA (700–800 W)	P ⩽ 5.5 kW
2kVA (1400W-1600W)	5.5 kW < P ⩽ 11 kW
3kVA (2100W-2400W)	15 kW ⩽ P ⩽ 22 kW

9.13.2 ARD for elevator emergency evacuation

1 Wiring

The following figure shows wiring of the ARD for elevator emergency evacuation.

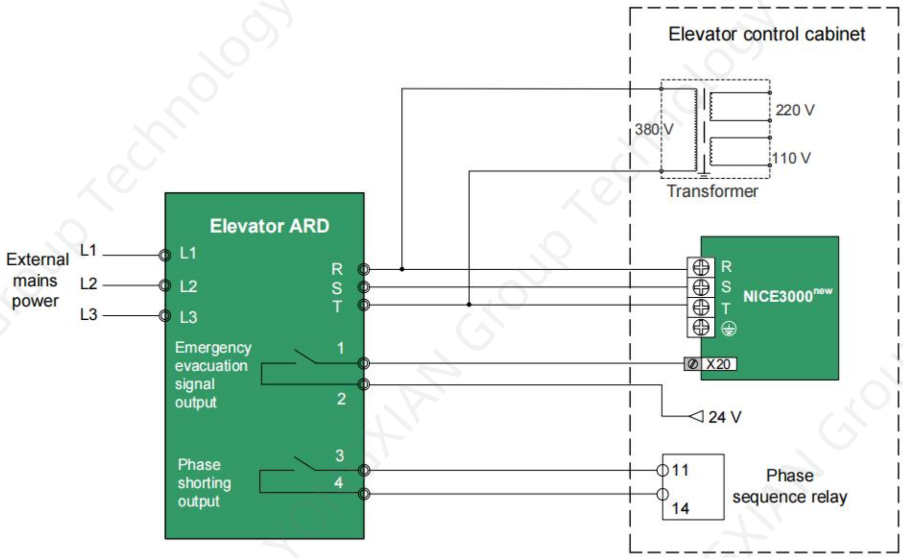


Figure 9-18 Wiring of three-phase (380 V) elevator ARD

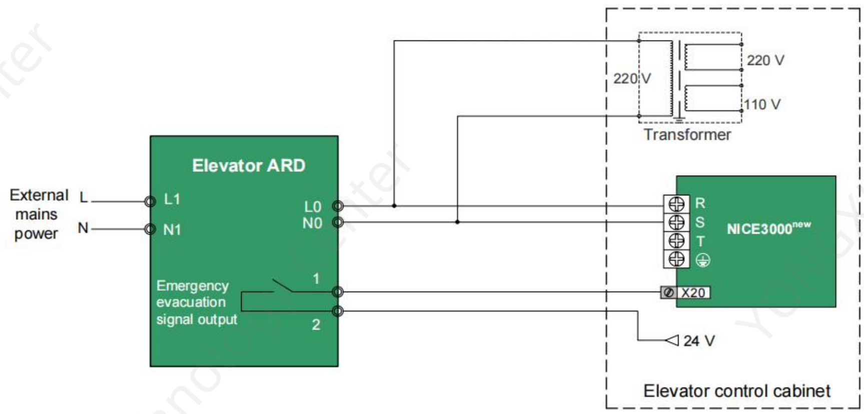


Figure 9-19 Wiring of single-phase (220 V) elevator ARD

2 Parameters

The parameter setting related to emergency evacuation by controller drive is described in the following table.

Function Code	Value	Description	Remarks
F8-10	1: UPS	Emergency evacuation operation mode at power failure	-
F5-20 (X20)	27	Emergency evacuation signal NO	Assume that X20 is used as the NO input of emergency evacuation signal.
F5-31	23	Emergency evacuation completed	It is used to notify that ARD emergency evacuation is completed.

The parameter setting related to emergency evacuation by shorting stator braking is described in the following table.

Function Code	Value	Description	Remarks
F8-10	0: Motor not running	Emergency evacuation operation mode at power failure	-
F5-20 (X20)	27	Emergency evacuation signal NO	Assume that X20 is used as the NO input of emergency evacuation signal.
F5-31	23	Emergency evacuation completed	It is used to notify that ARD emergency evacuation is completed.

NOTE

Pay attentions to the following precautions:

- Select the ARD with the nominal output power equal to or larger than the motor rated power.
- For the 380 V elevator ARD, only two phases are used for emergency evacuation output, and you need to ensure that wiring to the controller is correct; the output is single-phase 380 V, and you need to ensure that the transformer meets the requirements on the input side.
- If CAN communication is used, F5-20/F5-31 needs not be set for ARD emergency evacuation.

Other parameters related to emergency evacuation

Function Code	Value	Description
F3-22	0.100–1.300 m/s^2	Acceleration rate at emergency evacuation
F6-48	0.010–0.630 m/s	Emergency evacuation switching speed
F6-49	0 to F6-00	Evacuation parking floor
F8-09	0.05m/s	Emergency evacuation operation speed at power failure

9.14 Parallel/Group Control Scheme

1 Background

The controller provides parallel control of two elevators and group control of 2 to 8 elevators, implementing proper allocation of elevators and improving running efficiency.

2 Overview

The NICE3000^{new} provides the function of elevator parallel or group control:

1) Parallel control of 2 elevators implemented by directly using the CAN2 communication port

2) Group control of multiple elevators with together use of the group control board MCTC-GCB-A

9.14.1 Parallel Control

1 Wiring

Default parallel control scheme (CAN2 communication port CN3)

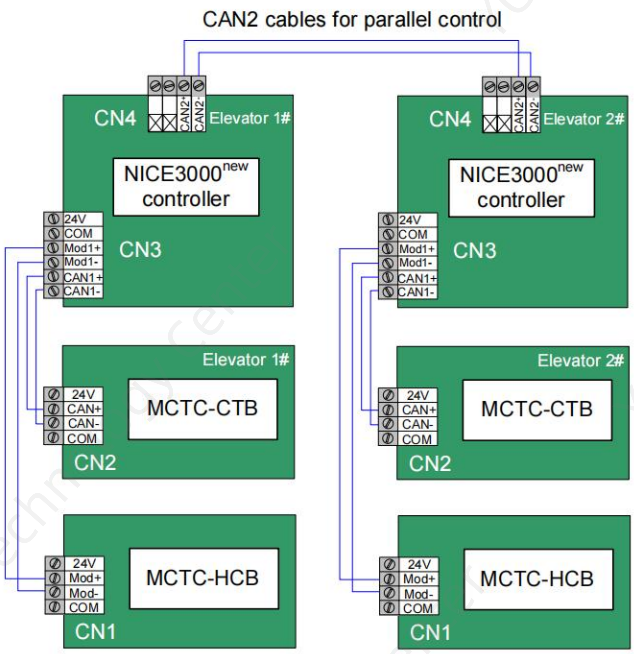


Figure 9-20 Wiring diagram of parallel control (via CN4)

Use description of parallel control (set the floor offset, F6-50 ≠ 0).

User floor: actual floor of the building

Physical floor: floor which either elevator stops at and provides service for or floor installed with the leveling plate.

For the same physical floor, the leveling plate must be installed for both the elevators. Even if one elevator need not stop at a certain floor, the leveling plate must be installed at this floor for this elevator. You can set the service floors of this elevator so that it does not stop at this floor.

The HCB addresses should be set according to physical floors of this elevator. Physical floors of different elevators may be inconsistent.

The top floor (F6-00) and bottom floor (F6-01) of each elevator should be set based on the corresponding physical floors of this elevator.

2 Parameters

Function Code	Description	Setting Range	Setting in Parallel Control	Remarks
F6-07	Number of elevators in parallel/ group mode	1 to 8	2	-
F6-08	Elevator No.	1 to 8	Main elevator:1; auxiliary elevator: 2	-
F6-09	Program control selection	-	Bit3 = 1: Parallel/group control implemented at CAN2	Set Bit3 to 1 when the CAN2 communication port CN4 is used for parallel/group control.

Example Two elevators in parallel control

Elevator 1# has one underground user floor and four overground user floors, but stops only at floor B1, floor 1, floor 2, and floor 3.

Elevator 2# has four overground user floors, but stops only at floor 1, floor 3, and floor 4.

The following figure shows related attributes both elevators:

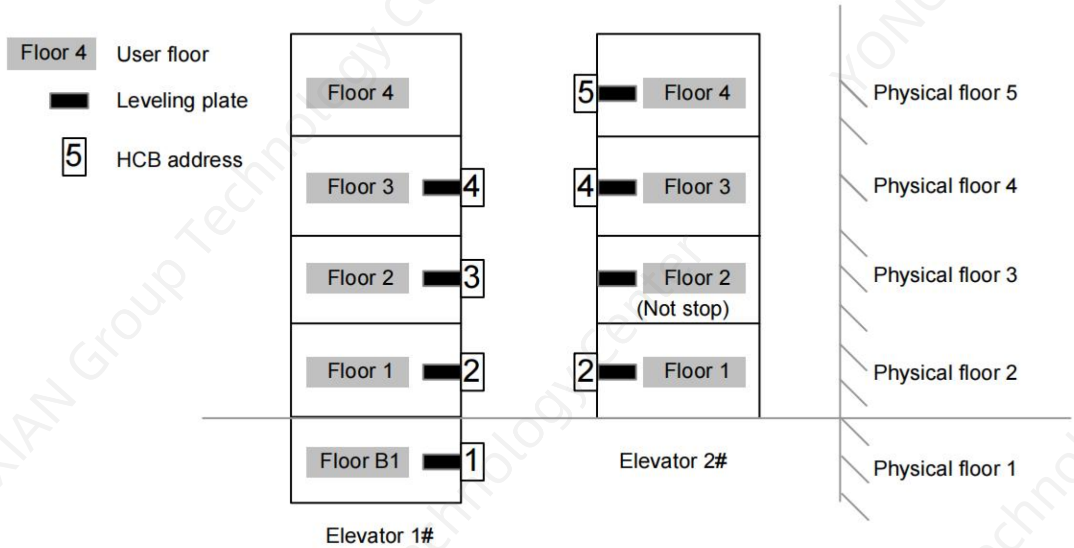


Figure 9-21 Floor diagram of two elevators in parallel control

Parameter setting and HCB addresses of two elevators

Table 9-6 Floor address setting for elevators in parallel control

		Elevator 1		Elevator 2	
Number of elevators in parallel/group mode (F6-07)		2		2	
Elevator No. (F6-08)		1		2	
User floor	Physical floor	HCB address	HCB display	HCB address	HCB display
B1	1	1	FE-01 = 1101	1	FE-01 = 1901
1	2	2	FE-02 = 1901	Non-stop floor, no hall call, but leveling plate required	-
2	3	3	FE-03 = 1902	3	FE-03 = 1903
3	4	4	FE-04 = 1903	4	FE-04 = 1904
4	5	No hall call	No hall call		
Bottom floor of the elevator (F6-01)		1		1	
Top floor of the elevator (F6-00)		4		4	
Service floor (F6-05)		65535		65533 (not stop at physical floor 2)	
Offset floor (F6-50)		0		1	

9.14.2 Group Control Scheme

A GCB (MCTC-GCB-A) is additionally required to implement group control of more than two elevators.

A single GCB supports group control of a maximum of 4 elevators.

If group control of more than 4 elevators is required, two GCBs need to be installed. This scheme is customized. For details, consult Inovance.

1 Wiring

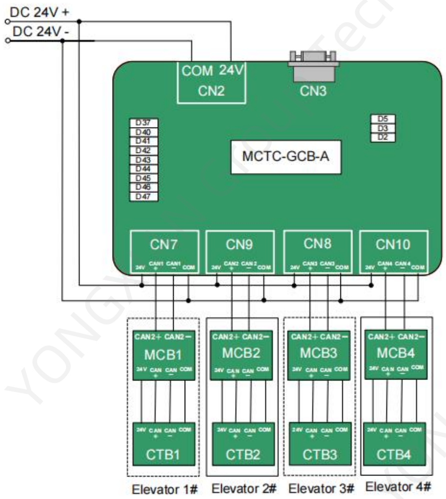


Figure 9-22 Wiring diagram of group control

NOTE

Pay attentions to the following precautions:

◆ For details of the use of the group control board, refer to 3.3.5 Group Control Board (MCTC-GCB-A).

2 Parameters

Function Code	Description	Setting Range	Setting in Group Control	Remarks
F6-07	Number of elevators in parallel/ group mode	1 to 8	1 to 8	Number of elevators in parallel/ group mode
F6-08	Elevator No.	1 to 8	1 to 8	Value "1": elevator 1# Value "2": elevator 2# Value "3": elevator 3# Value "4": elevator 4#
F6-09	Program control selection	-	Bit3 = 1: Parallel/group control implemented at CAN2	Set Bit3 to 1 when the CAN2 communication port CN4 is used for parallel/group control.
		-	Bit4 = 1: Group control in compatibility with NICE3000	Set Bit4 to 1 when the NICE3000 is involved in group control.

You need not set the CTB address for group control. The CTB (MCTC-CTB-A) address is not differentiated in group control mode.

9.15 Opposite Door Control Scheme

1 Background

This function implements separate control on two doors of an elevator.

2 Overview

The NICE3000^{new} supports four opposite door control modes: mode 1, mode 2, mode 3, and mode 4, as described in the following table.

Table 9-7 Opposite door control modes

Type	Door Control Mode	Description
Mode 1	Simultaneous control	The front door and back door acts simultaneously upon arrival for hall calls and car calls.
Mode 2	Hall call independent, car call simultaneous	Hall call: The corresponding door opens upon arrival for hall calls from this door. Car call: The front door and back door act simultaneously upon arrival for car calls.
Mode 3	Hall call independent, car call manual control	Hall call: The corresponding door opens upon arrival for hall calls from this door. Car call: Upon arrival for car calls, the door to open is selected between the front door and back door by using the door switchover switch. There are two door open states for car call: only front door open and only back door open.
Mode 4	Hall call independent, car call independent	Hall call: The corresponding door opens upon arrival for hall calls from this door. Car call: The corresponding door opens upon arrival for car calls from this door.

These opposite door control modes can be implemented by using two methods.

Scheme 1: Application suitable for NICE3000^{new} only. Recommended

Scheme 2: Application suitable for NICE3000^{new} and NICE3000

9.15.1 Opposite Door Control Scheme 1 (Recommended)

1 Wiring

1) CCB wiring

CCB wiring of single operation box CCB wiring of double operation boxes

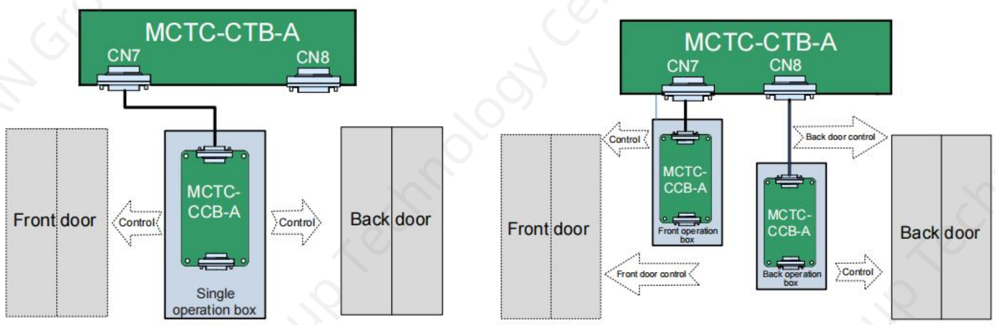


Figure 9-23 CCB wiring

2) HCB setting

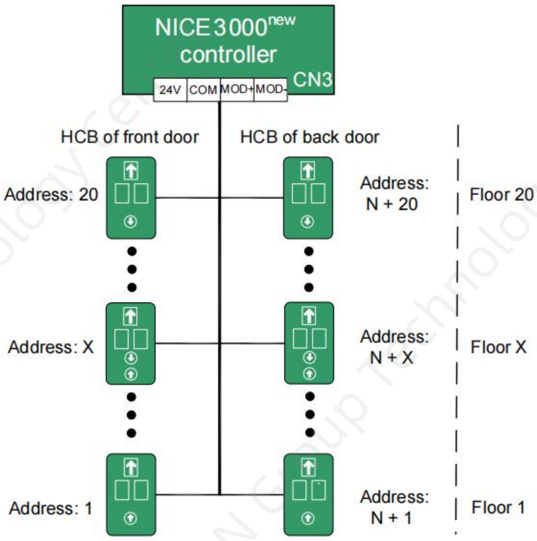


Figure 9-24 HCB setting diagram 1

- HCB addresses of front door: 1 to 20
- HCB address of back door: N to N+20, F8-16 = N (N > F6-00)

3 Parameters

Type	Door Control Mode	Parameter Setting		Service Floor	Operation Box CCB Wiring	HCB Address Setting
		Mode Selection	Other Parameters			
Mode 1	Simultaneous control	FC-04 = 0	FB-00 = 2 (CTB analog input) F8-16 = N (N > F6-00)	20	The CCB of front door is connected to CN7 on the CTB. The CCB of back door is connected to CN8 on the CTB.	HCB address of front door: 1–20 HCB address of back door: N to N+20
Mode 2	Hall call independent, car call simultaneous	FC-04 = 1	Same as mode 1	20		
Mode 3	Hall call independent, car call manual control	FC-04 = 2 (CTB analog input) F6-40 Bit4 = 1	Same as mode 1	20		
Mode 4	Hall call independent, car call independent	FC-04 = 3	Same as mode 1	20		

In mode 3, the car door to open is controlled as follows:

◆ Control by button

Connect the button to JP16 on the CCB, and set F6-40 Bit2 to 1. When the button indicator is steady ON, only the front door opens; when the button indicator is steady OFF, only the back door opens.

◆ Control by switch

Connect the switch to JP20 on the CCB, and set F6-40 Bit15 to 1. When JP20 is ON, only the front door opens; when JP20 is OFF, only the back door opens.

9.15.2 Opposite Door Control Scheme 2

1 Wiring

1) CCB wiring

The following figures show the CCB wiring of the operation box in modes 1, 2, and 3.

CCB wiring of single operation box CCB wiring of double operation boxes

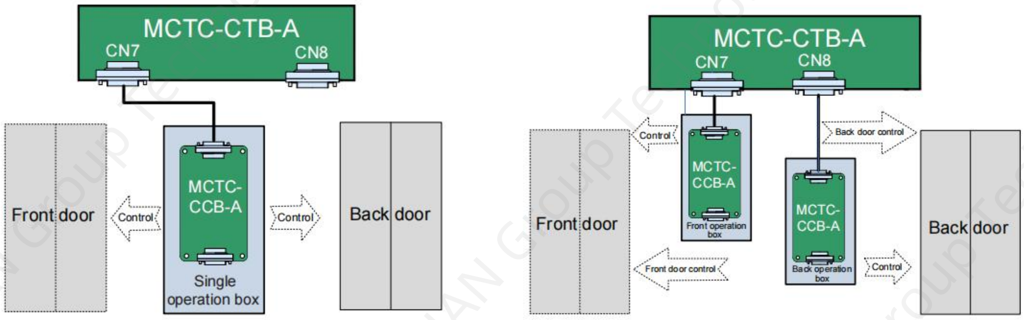


Figure 9-25 CCB wiring in modes 1, 2, and 3

The following figures show the CCB wiring of the operation box in mode 4.

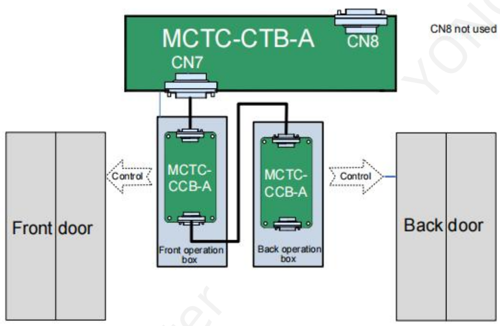


Figure 9-26 CCB wiring in mode 4

2) HCB setting

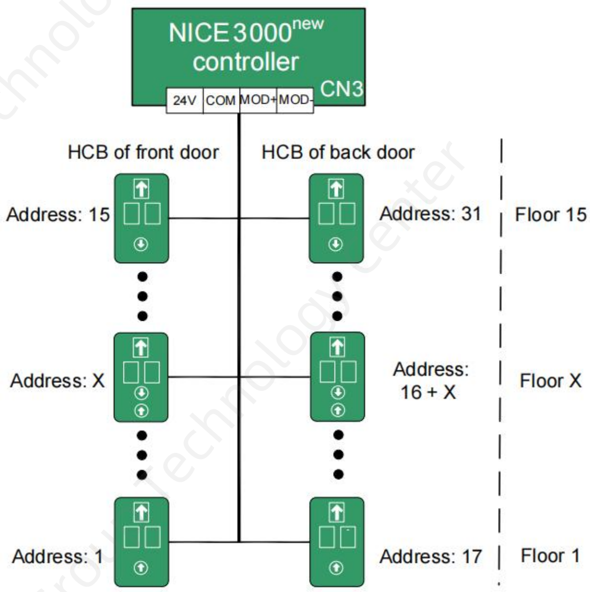


Figure 9-27 HCB setting of 15-floor opposite door control

HCB addresses of front door: 1 to 15
HCB+16 addresses of back door: 17 to 31

3 Parameters

<table>
<tr><th rowspan="2">Type</th><th rowspan="2">Door Control Mode</th><th colspan="2">Parameter Setting</th><th rowspan="2">Service Floor</th><th rowspan="2">Operation Box CCB Wiring</th><th rowspan="2">HCB Address Setting</th></tr>
<tr><th>Mode Selection</th><th>Other Parameters</th></tr>
<tr><td>Mode 1</td><td>Simultaneous control</td><td>FC-04 = 0</td><td>FB-00 = 2 (CTB analog input)
FE-33 Bit15 = 1</td><td>15</td><td rowspan="3">The CCB of front door is connected to CN7 on the CTB.
The CCB of back door is connected to CN8 on the CTB.</td><td rowspan="4">HCB address of front door: 1–15
HCB address of back door: 17–31</td></tr>
<tr><td>Mode 2</td><td>Hall call independent, car call simultaneous</td><td>FC-04 = 1</td><td>Same as mode 1</td><td>15</td></tr>
<tr><td>Mode 3</td><td>Hall call independent, car call manual control</td><td>FC-04 = 2 (CTB analog input)
F6-40 Bit4 = 1</td><td>Same as mode 1</td><td>15</td></tr>
<tr><td>Mode 4</td><td>Hall call independent, car call independent</td><td>FC-04 = 3</td><td>Same as mode 1</td><td>15</td><td>The CCB of front door is connected to CN7 on the CTB.
The CCB of back door is connected to the CCB of front door in cascade.</td></tr>
<tr><td colspan="7">In mode 3, the car door to open is controlled as follows:
◆ The control switch is connected to JP16 on the CCB. When JP16 is ON, only the front door opens; when JP16 is OFF, only the back door opens.</td></tr>
</table>

9.16 STO Application Scheme

1 Background

The safe torque off (STO) technology is used in the system without contactor in the elevator contactor and makes the safety level reach SIL3. At stop due to faults, the system disconnects the safety circuit and triggers the STO function; the controller stops torque output and implements safe braking on the motor to ensure elevator running safety.

2 Overview

The controller with the STO function and a STO card are required, as described in the following table.

Materials	Materials Model	Materials Description
Special controller	Customized	Special NICE3000^{new} controller with the STO function
STO card	MCTC-JCB-A2	STO card used together with the drive board

The following figure shows the connection between the NICE3000^{new} and the STO card.

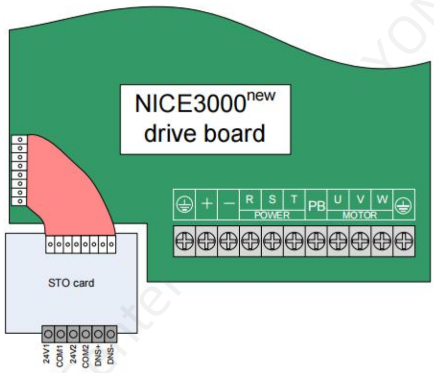


Figure 9-28 Connection between the controller drive board and the STO card

The description of each STO terminal is as follows:

Pin	Signal	Label	Voltage	Description
1	STOA	24V1	0 V / 24 V	STO channel A input
2	GND_STOA	COM1	0 V	Reference ground of STO channel A input
3	STOB	24V2	0 V / 24 V	STO channel B input
4	GND_STOB	COM2	0 V	Reference ground of STO channel B input
5	DNS+	DNS+	0 V / 24 V	STO feedback positive
6	DNS-	DNS-	0 V	STO feedback negative

STOA and STOB are the two channels of STO. Each channel can stop the output of the AC drive. The dual-channel design is SIL3 compliant.

DNS+ and DNS- are feedback terminals of STO. They are connected to the monitor controller to detect damage on the STO circuit.

9.16.1 110 V Safety Circuit

The STO function takes the place of the RUN contactor, and is wired in the same way as the RUN contactor. A safety relay is used to adapt the 24 V input of the STO card to the 110 V power of common safety circuit.

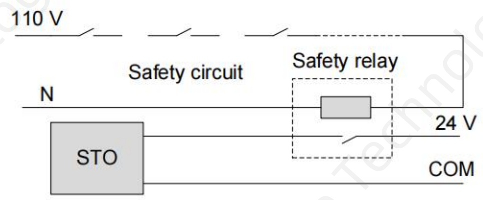


Figure 9-29 STO wiring under 110 V safety circuit

The RUN contactor is replaced with a safety relay and a STO card. The feedback terminals DNS+ and DNS- of the STO card are connected to the DI terminals of the MCB, and the power flows from DNS+ to DNS- (similar to a single-direction switch).

9.16.2 24V Safety Circuit

If it is the 24 V safety circuit, the STO card can be directly connected to the safety circuit, as shown in the following figure.

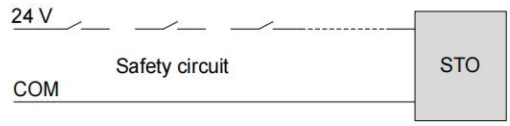


Figure 9-30 STO wiring under 24V safety circuit

The RUN contactor is replaced directly with a STO card.

9.17 Application Scheme of Emergency Operation and Dynamic Test Device of Equipment-roomless Elevator

1 Background

According to international requirements, the emergency and test operation panel should provide the following functions:

1) Control device for dynamic test that can be accessible and operated safely and conveniently from outside the shaft in any way.

2) A display device or an inspection window for direct observation of the drive motor to obtain car running direction, car arrival at the unlocking zone, and car speed.

That is, you can, directly or through the display device, observe car movement direction, speed, and whether the car is located in the unlocking zone. The permanent lighting, lighting switch, and stop device or main switch shall be provided on the device.

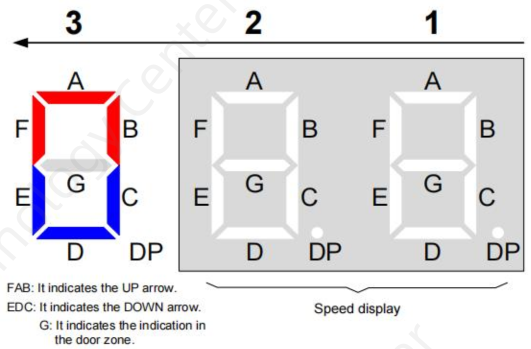
2 Overview

The controller with the STO function and a STO card are required, as described in the preceding table.

1) Software implementation scheme

The MCB LEDs are used to implement monitoring over car direction, speed, and door zone position.

After you enter the F-b menu, the LEDs display the trigger state of the emergency and test operation panel. The following figure shows the meanings of the segment codes:



Note: When the speed is smaller than 1.000 m/s, the LEDs display ".xx m/s". When the speed is greater than 1 m/s, the LEDs display "x.x m/s". Therefore, the decimal places are different.

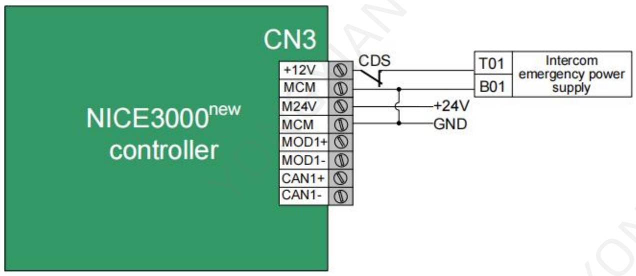
The system automatically goes to this interface in the following three cases:

- Emergency evacuation state;
- 12 V input in case of 24 power failure (MCB hardware F01 or later version);
- Pulse change in stop state.

2) Electrical implementation scheme

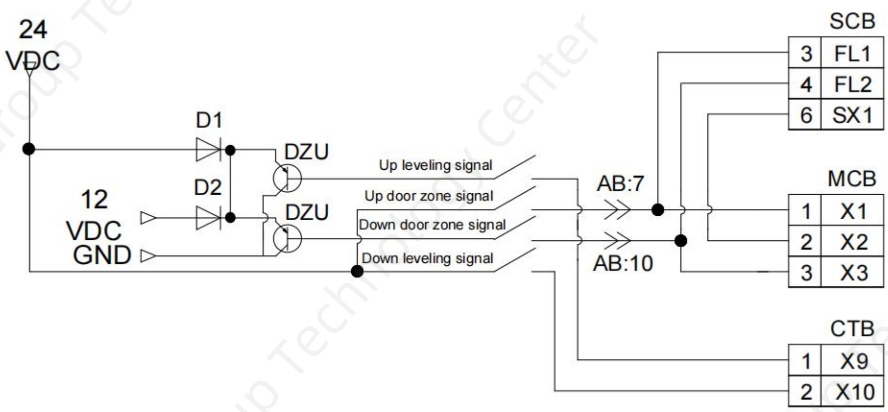
In case of power failure, this function can be implemented by using the 12 V power supply of the intercom system or electric brake release device to supply power to the MCB.

- As 12 V input in case of power failure, 12 V and MCM terminals are added on the MCB to supply power to the PG card encoder so as to provide direction and speed feedback during emergency evacuation by shorting stator braking.
- CDS (equipment-roomless control cabinet door switch) is added. When the cabinet door is open, the switch contact is ON and 12 V is supplied to terminal CN3.
- This switch mainly prevents insufficient voltage of emergency power supply due to long-term connection of 12 V to the system in case of power failure.
- 12 V and 24 V require common ground connection.



12 V input is added on the up and down leveling optoelectronic signal and power supply side. The 12 V power supply comes from the intercom emergency lighting. The action of the optoelectronic switch is driven by the emergency light upon power failure.

- The leveling optoelectronic switch must have a wide voltage of 10 — 30 V (Weton SGD31 optoelectronic switches satisfy this condition).
- The 9 V voltage terminal X of the new hardware version of the MCB can identify that signals are active.
- A 1N4007 diode with 1 A rated current and 1000 V reverse breakdown voltage must be used for mutual separation on the optoelectronic power supply side.



Memo NO. __________

Date / /

Chapter 10 Appendixes

Appendix A Foreign Standards

A.1 Important Notes

Figure A-1 CE mark

1) The CE mark indicates compliance with European safety and environmental regulations. It is required for engaging in business and commerce (production, import, and sales) in Europe. European standards include the Machinery Directive for machine manufacturers, the Low Voltage Directive for electronics manufacturers, and the EMC guidelines for controlling noise.
2) The NICE3000^{new} is labeled with the CE mark based on the following EMC guidelines and the Low Voltage Directive.
3) Low Voltage Directive: 2014/35/EU
4) EMC Guidelines: 2014/30/EU
5) Machines and devices used in combination with this controller must also be CE certified and labeled.
6) The integrator who integrates the controller with the CE mark into other devices has the responsibility of ensuring compliance with CE standards and verifying that conditions meet European standards.

A.2 CE Low Voltage Directive Compliance

This controller has been tested according to IEC 61800-5-1: 2007, and it complies with the Low Voltage Directive.

To enable machines and devices integrating this controller to comply with the Low Voltage Directive, be sure to meet the following conditions.

A.2.1 Mounting Location

Mount the controller in places with pollution not higher than severity 2 and overvoltage category 3 in accordance with IEC60664.

A.2.2 Installing Fuse on the Input Side

To prevent accidents caused by short circuit, install fuse on the input side and the fuse must comply with the UL standard. Select the fuse according to Table 3-2 Peripheral device selection of the NICE3000^{new}.

For input current and output current of the controller, refer to Table 1-1 Main technical data of NICE3000^{new}.

For the recommended fuse models, refer to 3.2.1 Selection Guide of Cable, Circuit Breaker, and Contactor.

A.2.3 Preventing Entry of Foreign Objects

The controller must be installed inside a cabinet. The final system installing the controller must have covers providing fire, electrical, and mechanical protection, and satisfy the regional laws & regulations and related IEC requirements.

A.2.4 Grounding

If using an controller of the 400 V class, tie the neutral point of the controller power supply to ground.

For the wiring example of controller complying with the Low Voltage Directive, see Figure 2-39

A.3 EMC Guidelines Compliance

Electromagnetic compatibility (EMC) describes the ability of electronic and electrical devices or systems to work properly in the electromagnetic environment and not to generate electromagnetic interference that influences other local devices or systems. In other words, EMC includes two aspects: The electromagnetic interference generated by a device or system must be restricted within a certain limit; the device or system must have sufficient immunity to the electromagnetic interference in the environment.

1) The controller complies with the EMC directives and standards EN12015:2014 and EN12016:2013 only when meeting the following requirements:
2) A built-in EMC filter must be installed on input side of the controller; the shielded cable is used on output side; the filter is reliably grounded and the shield layer of the output cables is 360° grounded. For selection of EMC filters, refer to the "Guide on Selection of Peripheral Electrical Elements" section.
3) The shielded cable is used as the drive cables between the controller and the motor. For cable selection and installation, refer to A.4.1 Requirements for Shielded Cable.
4) The controller and wiring shall be installed by a recommended wiring method. For details, refer to A.4.2 System Wiring Requirements.
5) A common-mode filter is installed if necessary. For details, refer to 3.2.7 Selection Guide of Common-Mode Filter.
6) When the controller is installed in the elevator system, the integrator of the system is responsible for compliance of the system with the European EMC directive (2014/30/EU) and standards EN12015:2014 and EN12016:2013.

When the system installed with the controller is used for other applications, the integrator of the system is responsible for compliance of the system with the European EMC directive (2014/30/EU) and standard EN 61800-3: 2004 +A1: 2012 according to the system application environment.

Danger
◆ When applied in the first environment, the controller may generate radio interference. Besides the CE compliance described in this chapter, take measures to avoid the radio interference if required.

A.4 Requirements on Cables and Cabling

A.4.1 Requirements for Shielded Cable

1) Use the shielded cable to connect the motor to meet the EMC requirements. The 4-conductor shielded cable is recommended with one conductor as the PE. If the 3-conductor shielded cable is used and the shield cannot meet the conduction requirements, an additional PE wire must be added.

■ Recommended cables:

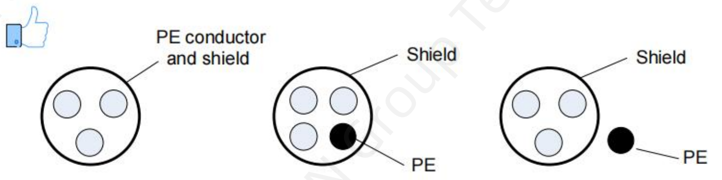


Figure A-2 Cross section of recommended shielded cables

■ Non-recommended power cables:

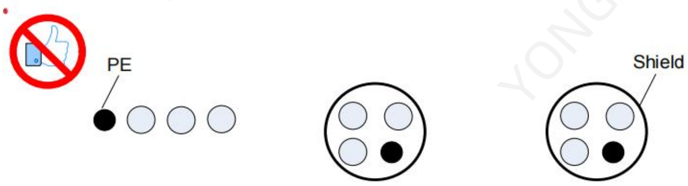


Figure A-3 Cross section of non-recommended shielded cables

2) To suppress emission and conduction of the radio frequency interference effectively, the shield of the shielded cable is cooper braid. The braided density of the cooper braid should be greater than 90% to enhance the shielding efficiency and conductivity. as shown in Figure A-4.

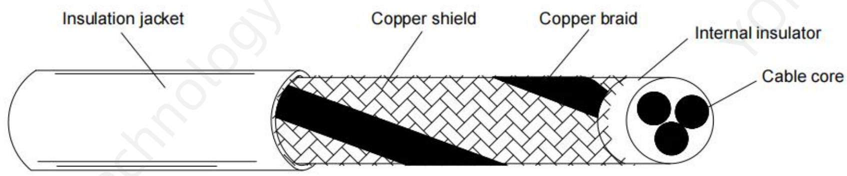


Figure A-4 Braided density of shield

3) The grounding area of the shielded cable must be as large as possible. Fasten the shield to the metal plate with the metal cable clamp, as shown in the following figure.

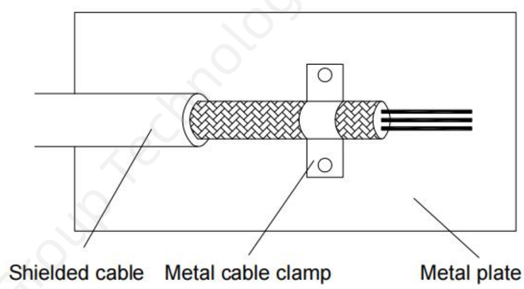
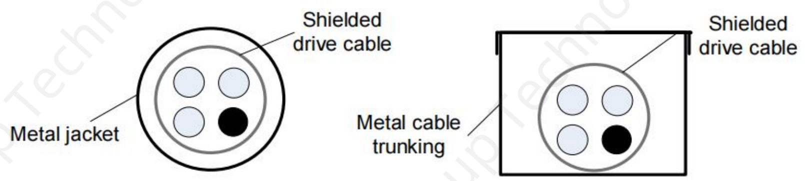


Figure A-5 Fastening the shield with the metal cable clamp

A.4.2 System Wiring Requirements

1) The motor cables must be far away from other cables. Recommended distance is bigger than 0.5 m. The several controllers can be laid in parallel.
2) It is recommended that the motor cables be protected in the metal sheathing or cabling duct with metal plate; both sides of the metal jacket and cabling duct must be grounded reliably.



3) To avoid electromagnetic interference caused by rapid change of the output voltage of the controller, the motor cables and other cables must not be laid side by side for a long distance. It is recommended that the motor cables, power input cables and control cables be laid in different trunking. The cable trunking must be in good connection and well grounded.
4) If the control cable must run across the power cable, make sure they are arranged at an angle of close to 90° . Do not run other cables above the controller.
5) The power input and output cables of the controller and weak-current signal cables (such as control wires) should be laid vertically (if possible) rather than in parallel.
6) The cable trunking must be in good connection and well grounded. Aluminum trunking can be used to improve electric potential.
7) The controller must be in good contact with the control cabinet. The contact area is coated to ensure good conductivity.
8) The motor must be in good contact with the system. The contact area is coated to ensure good conductivity.

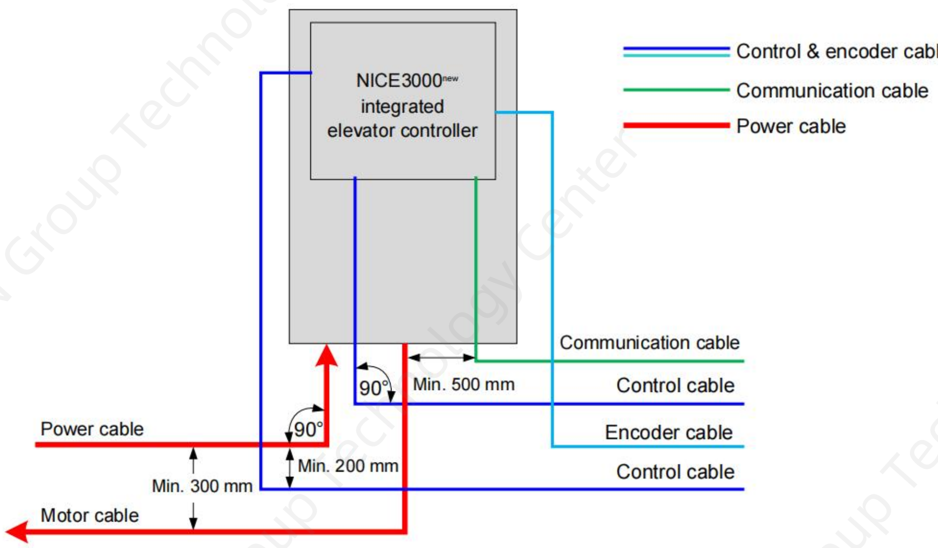


Figure A-6 Cabling requirements

A.5 Solutions to Current Leakage

The controller outputs high-speed pulse voltage, producing high-frequency leakage current during running of the controller.

If there is no internal EMI filter, each controller produces above 100 mA leakage current. Therefore, it is necessary to select an ELCB with rated operating current of 200 mA above.

If there is an internal EMI filter, each controller produces leakage current lower than 100 mA. Therefore, it is necessary to select an ELCB with rated operating current of 100 mA and above.

The controller generates DC leakage current in protective conductor. In this case, a time-delay B-type ELCB must be used.

If multiple controllers are used, an ELCB must be provided for each controller.

1) The factors that influence the leakage current are as follows:

- Controller capacity
- Carrier frequency
- Types and length of motor cable
- EMI filter

2) When the leakage current causes the ELCB to act, you should:

- Increase the rated action current of the ELCB.
- Replace it with a time-delay B-type ELCB with high-frequency suppression function.
- Reduce the carrier frequency.
- Shorten the length of the output drive cable.
- Install a current leakage suppression device.
- Use Chint Electric and Schneider brands.

A.6 Requirements on residual current device (RCD)

The servo drive generates high leakage current during running, which flows through the protective earthing conductor. Thus install a type-B RCD at primary side of the power supply. When selecting the RCD, you should consider the transient and steady-state leakage current to ground that may be generated at startup and during running of the servo drive. You can select a specialized RCD with the function of suppressing high harmonics or a 300 mA general-purpose RCD with a residual current that is 2 to 4 times the protective conductor current.

A.7 Solutions to EMC Interference

The controller generates very strong interference. Although EMC measures are taken, the interference may still exist due to improper cabling or grounding during use. When the controller interferes with other devices, adopt the following solutions.

Table A-1 Typical EMC interference problems and solutions

Interference Type	Solution
ELCB tripping	◆ Reduce the carrier frequency. ◆ Shorten the length of the controller cables. ◆ Wind a magnetic ring around the controller input cables except the PE cable. ◆ For tripping at the moment of power-on, cut off the large capacitor to ground on the power input side by disconnecting the grounding side of the external or built-in filter and disconnecting the grounding side of the Y capacitor to ground of the input terminals. ◆ For tripping during controller running or when controller is enabled, take leakage current suppression measures (install a leakage current filter, install safety capacitor + wind magnetic ring, wind magnetic ring).
Controller interference during running	◆ Connect the motor housing to the PE of the controller. ◆ Connect the PE of the controller to the PE of the mains voltage. ◆ Wind the power input cables with a magnetic ring. ◆ Add a safety capacitor or magnetic ring to the interfered signal terminal. ◆ Add an extra common ground.
Communication interference	◆ Connect the motor housing to the PE of the controller. ◆ Connect the PE of the controller to the PE of the mains voltage. ◆ Wind the power input cable with magnetic rings. ◆ Add a termination resistor between the communication cable source and the load side. ◆ Add a common grounding cable besides the communication differential cable. ◆ Use a shielded cable as the communication cable and connect the cable shield to the common ground. ◆ Adopt daisy chain mode for multi-node communication and reserve branch length of less than 30 cm.
I/O interference	◆ Enlarge the capacitance at the low-speed DI. A maximum of 0.1 uF capacitance is suggested. ◆ Enlarge the capacitance at the AI. A maximum of 0.22 uF is suggested.

Appendix B Parameter Table

Function Code	Name	Setting Range	Default	Unit	Property	Page
Group F0: Basic parameters						
F0-00	Control mode	0: Sensorless vector control (SVC) 1: Closed-loop vector control (CLVC) 2: Voltage/Frequency (V/F) control	1	-	★	P182
F0-01	Command source selection	0: Operation panel control 1: Distance control	1	-	★	
F0-02	Running speed under operation panel control	0.050 to F0-04	0.050	m/s	☆	P183 to P184
F0-03	Maximum running speed	0.250 to F0-04	1.600	m/s	★	
F0-04	Rated elevator speed	0.250 to 4.000	1.600	m/s	★	
F0-05	Rated elevator load	300 to 9999	1000	kg	★	
F0-06	Maximum frequency	F1-04 to 99.00	50.00	Hz	★	
F0-07	Carrier frequency	0.5 to 16.0	6.0	kHz	★	
Group F1: Motor parameters						
F1-00	Encoder type	0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: Endat absolute encoder	0	-	★	P185
F1-01	Rated motor power	0.7 to 75.0	Model dependent	kW	★	
F1-02	Rated motor voltage	0 to 600	Model dependent	V	★	
F1-03	Rated motor current	0.00 to 655.00	Model dependent	A	★	
F1-04	Rated motor frequency	0.00 to F0-06	Model dependent	Hz	★	
F1-05	Rated motor speed	0 to 3000	Model dependent	RPM	★	
F1-06	Encoder initial angle (synchronous motor)	0.0 to 359.9	0	°	★	
F1-07	Encoder angle at power-off (synchronous motor)	0.0 to 359.9	0	°	★	
F1-08	Synchronous motor wiring mode	0 to 15	0	-	★	
F1-09	Current filter time (synchronous motor)	0.0 to 359.9	0	-	★	P186
F1-10	Encoder verification selection	0 to 65535	0	-	★	
F1-11	Auto-tuning mode	0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning 1 4: Shaft auto-tuning 2 5: Static auto-tuning	0	-	★	
F1-12	Encoder pulses per revolution	0 to 10000	2048	PPR	★	P187
F1-13	Encoder wire-breaking detection time	0 to 10.0	2.1	s	★	
F1-14	Stator resistance (asynchronous motor)	0.000 to 30.000	Model dependent	Ω	★	
F1-15	Rotor resistance (asynchronous motor)	0.000 to 30.000	Model dependent	Ω	★	
F1-16	Leakage inductance (asynchronous motor)	0.00 to 300.00	Model dependent	mH	★	
F1-17	Mutual inductance (asynchronous motor)	0.1 to 3000.0	Model dependent	mH	★	
F1-18	No-load current (asynchronous motor)	0.01 to 300.00	Model dependent	A	★	
F1-19	Shaft Q inductance (torque)	0.00 to 650.00	3.00	mH	★	
F1-20	Shaft D inductance (excitation)	0.00 to 650.00	3.00	mH	★	
F1-21	Back EMF coefficient	0 to 65535	0	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
F1-22	Auto-tuning function selection	Bit1 = 1, Bit2 = 0: Semi-automatic angle-free auto-tuning Bit1 = 1, Bit2 = 1: Full-automatic angle-free auto-tuning	0	-	★	P188
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor	1	-	★	
		Group F2: Vector control parameters				
F2-00	Speed loop proportional gain 1	0 to 100	40	-	★	P188 to P189
F2-01	Speed loop integral time 1	0.01 to 10.00	0.60	s	★	
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	★	
F2-03	Speed loop proportional gain 2	0 to 100	35	-	★	
F2-04	Speed loop integral time 2	0.01 to 10.00	0.80	s	★	
F2-05	Switchover frequency 2	F2-02 to F0-06	5.00	Hz	★	
F2-06	Current loop proportional gain	10 to 500	60	-	★	
F2-07	Current loop integral gain	10 to 500	30	-	★	
F2-08	Torque upper limit	0.0 to 200.0	200.0	%	★	P189 to P190
F2-10	Elevator running direction	0: Direction unchanged 1: Direction reversed	0	-	★	
F2-11	Zero servo current coefficient	2.0 to 50.0	15.0	%	★	
F2-12	Zero servo speed loop Kp	0.00 to 2.00	0.50	-	★	
F2-13	Zero servo speed loop Ti	0.00 to 2.00	0.60	-	★	
F2-16	Torque acceleration time	1 to 500	1	ms	★	
F2-17	Torque deceleration time	1 to 3000	350	ms	★	
		Group F3: Running control parameters				
F3-00	Startup speed	0.000 to 0.050	0.000	m/s	★	P191 to P192
F3-01	Startup speed holding time	0.000 to 5.000	0.000	s	★	
F3-02	Acceleration rate	0.200 to 1.500	0.700	m/s2	★	
F3-03	Acceleration start jerk time	0.300 to 4.000	1.500	s	★	
F3-04	Acceleration end jerk time	0.300 to 4.000	1.500	s	★	
F3-05	Deceleration rate	0.200 to 1.500	0.700	m/s2	★	
F3-06	Deceleration end jerk time	0.300 to 4.000	1.500	s	★	
F3-07	Deceleration start jerk time	0.300 to 4.000	1.500	s	★	
F3-08	Special deceleration rate	0.200 to 1.500	0.900	m/s2	★	
F3-09	Pre-deceleration distance	0 to 90.0	0.0	mm	★	P193
F3-10	Re-leveling speed	0.020 to 0.080	0.040	m/s	★	
F3-11	Inspection speed	0.100 to 0.630	0.250	m/s	★	
F3-12	Position of up slow-down 1	0.00 to 300.00	0.00	m	★	
F3-13	Position of down slow-down 1	0.00 to 300.00	0.00	m	★	
F3-14	Position of up slow-down 2	0.00 to 300.00	0.00	m	★	
F3-15	Position of down slow-down 2	0.00 to 300.00	0.00	m	★	
F3-16	Position of up slow-down 3	0.00 to 300.00	0.00	m	★	
F3-17	Position of down slow-down 3	0.00 to 300.00	0.00	m	★	
F3-18	Zero-speed control time at startup	0.200 to 1.000	0.200	s	★	P194
F3-19	Brake release delay	0.000 to 2.000	0.600	s	★	
F3-20	Zero-speed control time at end	0.000 to 1.000	0.300	s	★	
F3-21	Low-speed re-leveling speed	0.080 to F3-11	0.100	m/s	★	P194 to P195
F3-22	Acceleration rate at emergency evacuation	0.100 to 1.300	0.300	m/s2	★	
F3-23	Slow-down delay deceleration time	0.00 to 10.00	0	s	★	
F3-24	Program function selection	0: Reserved 1: Slip experiment function enabled 2: UCMP test function enabled	0	-	★	
F3-25	Emergency electric RUN speed	0.100 to 0.300	0.250	m/s	★	
F3-26	Shaft auto-tuning speed	0.250 to 0.630	0.250	m/s	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
Group F4: Floor parameters						
F4-00	Leveling adjustment	0 to 60	30	mm	★	P196
F4-01	Current floor	F6-01 to F6-00	1	-	★	
F4-02	High byte of current floor position	0 to 65535	1	Pulses	●	
F4-03	Low byte of current floor position	0 to 65535	34464	Pulses	●	
F4-04	Length 1 of leveling plate	0 to 65535	0	Pulses	★	
F4-05	Length 2 of leveling plate	0 to 65535	0	Pulses	★	
F4-06	High byte of floor height 1	0 to 65535	0	Pulses	★	P197
F4-07	Low byte of floor height 1	0 to 65535	0	Pulses	★	
F4-08	High byte of floor height 2	0 to 65535	0	Pulses	★	
F4-09	Low byte of floor height 2	0 to 65535	0	Pulses	★	
F4-10	High byte of floor height 3	0 to 65535	0	Pulses	★	
F4-11	Low byte of floor height 3	0 to 65535	0	Pulses	★	
F4-12	High byte of floor height 4	0 to 65535	0	Pulses	★	
F4-13	Low byte of floor height 4	0 to 65535	0	Pulses	★	
F4-14	High byte of floor height 5	0 to 65535	0	Pulses	★	
F4-15	Low byte of floor height 5	0 to 65535	0	Pulses	★	
F4-16	High byte of floor height 6	0 to 65535	0	Pulses	★	
F4-17	Low byte of floor height 6	0 to 65535	0	Pulses	★	
F4-18	High byte of floor height 7	0 to 65535	0	Pulses	★	
F4-19	Low byte of floor height 7	0 to 65535	0	Pulses	★	
F4-20	High byte of floor height 8	0 to 65535	0	Pulses	★	
F4-21	Low byte of floor height 8	0 to 65535	0	Pulses	★	
F4-22	High byte of floor height 9	0 to 65535	0	Pulses	★	
F4-23	Low byte of floor height 9	0 to 65535	0	Pulses	★	
F4-24	High byte of floor height 10	0 to 65535	0	Pulses	★	
F4-25	Low byte of floor height 10	0 to 65535	0	Pulses	★	
High and low bytes of floor height 11 to floor height 37						
F4-80	High byte of floor height 38	0 to 65535	0	Pulses	★	P197
F4-81	Low byte of floor height 38	0 to 65535	0	Pulses	★	
F4-82	High byte of floor height 39	0 to 65535	0	Pulses	★	
F4-83	Low byte of floor height 39	0 to 65535	0	Pulses	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
Group F5: Terminal function parameters						
F5-00	Attendant/Automatic switchover time	3 to 200	3	s	★	P197 to P200
F5-01	X1 function selection	00: Invalid 01/33: Up leveling signal NO/NC 03/35: Door zone signal NO/NC 02/34: Down leveling signal NO/NC 04/36: Safety circuit feedback NO/NC 05/37: Door lock circuit feedback NO/NC 06/38: RUN contactor feedback NO/NC 07/39: Brake contactor feedback NO/NC 08/40: Inspection signal NO/NC 09/41: Inspection/emergency drive up signal NO/NC 10/42: Inspection/emergency drive down signal NO/NC 11/43: Fire emergency signal NO/NC 12/44: Up limit signal NO/NC 13/45: Down limit signal NO/NC 14/46: Overload signal NO/NC 15/47: Full-load signal NO/NC 16/48: Up slow-down 1 signal NO/NC 17/49: Down slow-down 1 signal NO/NC 18/50: Up slow-down 2 signal NO/NC 19/51: Down slow-down 2 signal NO/NC 20/52: Up slow-down 3 signal NO/NC 21/53: Down slow-down 3 signal NO/NC 22/54: Shorting door lock circuit contactor feedback NO/NC 23/55: Firefighter running signal NO/NC 24/56: Door machine 1 light curtain signal NO/NC 25/57: Door machine 2 light curtain signal NO/NC 26/58: Brake travel switch 1 NO/NC 27/59: Emergency evacuation signal NO/NC 28/60: Elevator lock signal NO/NC 29/61: Safety circuit 2 feedback NO/NC 30/62: Shorting PMSM stator feedback NO/NC 31/63: Door lock circuit 2 feedback NO/NC 65/97: Door machine 1 safety edge signal NO/NC 66/98: Door machine 2 safety edge signal NO/NC 67/99: Motor overheat signal NO/NC 68/100: Earthquake signal NO/NC 69/101: Back door forbidden signal NO/NC 70/102: Light-load signal NO/NC 71/103: Half-load signal NO/NC 72/104: Fire emergency floor switchover signal NO/NC 76/108: Door 1 open input NO/NC 77/109: Door 2 open input NO/NC 78/110: Brake travel switch 2 input NO/NC 79/111: External fault input NO/NC 80/112: End floor verification signal NO/NC 81/113: Door lock 1 shorting signal NO/NC 82/114: Door lock 2 shorting signal NO/NC 84/116: Emergency drive signal NO/NC 86/118: Door lock bypass input NO/NC Note: For the same signal, NC setting parameter = NO setting parameter + 32	33	-	★	
F5-02	X2 function selection		35	-	★	
F5-03	X3 function selection		34	-	★	
F5-04	X4 function selection		4	-	★	
F5-05	X5 function selection		5	-	★	
F5-06	X6 function selection		38	-	★	
F5-07	X7 function selection		39	-	★	
F5-08	X8 function selection		22	-	★	
F5-09	X9 function selection		40	-	★	
F5-10	X10 function selection		09	-	★	
F5-11	X11 function selection		10	-	★	
F5-12	X12 function selection		44	-	★	
F5-13	X13 function selection		45	-	★	
F5-14	X14 function selection		48	-	★	
F5-15	X15 function selection		49	-	★	
F5-16	X16 function selection		50	-	★	
F5-17	X17 function selection		51	-	★	
F5-18	X18 function selection		00	-	★	
F5-19	X19 function selection		00	-	★	
F5-20	X20 function selection		00	-	★	
F5-21	X21 function selection		00	-	★	
F5-22	X22 function selection		00	-	★	
F5-23	X23 function selection		00	-	★	
F5-24	X24 function selection		00	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
F5-25	CTB input type	0 to 511	320	-	★	P204 to 206
F5-26	Y1 function selection	0: Disabled 1: RUN contactor 2: Brake contactor 3: Shorting door lock circuit contactor 4: Fire emergency floor arrival signal feedback 5: Door machine 1 open 6: Door machine 1 close 7: Door machine 2 open 8: Door machine 2 close 9: Brake and RUN contactors healthy 10: Fault state 11: Running state 12: Shorting motor stator contactor 13: Emergency evacuation automatic switchover 14: System healthy 15: Emergency buzzer control 16: Higher-voltage startup of brake 17: Elevator running in up direction 18: Lamp/Fan running 19: Medical sterilization 20: Non-door zone stop 21: Electric lock 22: Non-service state 23: Emergency evacuation completed 25: Wire holder reset 26: Braking pipe short circuit output 27: Alarm filter output	1	-	★	
F5-27	Y2 function selection		2	-	★	
F5-28	Y3 function selection		3	-	★	
F5-29	Y4 function selection		4	-	★	
F5-30	Y5 function selection		0	-	★	
F5-31	Y6 function selection		0	-	★	
F5-32	Communication status	CANbus and Modbus communication state monitoring	-	-	●	P200 to P208
F5-33	F5-33 Program control selection	Bit3: Elevator fire emergency requirement for Hong Kong Bit4: Arrival gong disabled at night Bit6: Door lock disconnected at inspection switched over to normal running Bit7: Fault code not displayed on the keypad Bit8: Door open command canceled immediately at door open limit Bit9: Car stop and zero-speed torque holding at abnormal brake feedback	0	-	★	
F5-34	Terminal state display	Monitoring of I/O terminals on MCB	-	-	●	
F5-35	Terminal state display	Monitoring of I/O terminals on CTB, CCB and HCB	-	-	●	
F5-36	Load cell input selection	0: MCB digital input 1: CTB digital input 2: CTB analog input 3: MCB analog input	1	-	★	
F5-37	X25 function selection	0: Invalid 4: Safety circuit signal 5: Door lock circuit signal 1 (high-voltage input detection point, checkable) 6: Door lock circuit signal 2 (high-voltage input detection point, checkable) 7: Door lock 1 shorting 8: Door lock 2 shorting	0	-	★	
F5-38	X26 function selection		0	-	★	
F5-39	X27 function selection		0	-	★	
F5-40	X28 function selection		0	-	★	
Group F6: Basic elevator parameters						
F6-00	Top floor of the elevator	F6-01 to 40	9	-	★	P209 to P211
F6-01	Bottom floor of the elevator	1 to F6-00	1	-	★	
F6-02	Parking floor	F6-01 to F6-00	1	-	★	
F6-03	Fire emergency floor	F6-01 to F6-00	1	-	★	
F6-04	Elevator lock floor	F6-01 to F6-00	1	-	★	
F6-05	Service floors 1	0 to 65535	65535	-	★	
F6-06	Service floors 2	0 to 65535	65535	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
F6-07	Number of elevators in parallel/ group mode	1 to 8	1	-	★	P212 to P213
F6-08	Elevator No.	1 to 8	1	-	★	
F6-09	Program control selection	Bit0: Dispersed waiting Bit2: Reserved Bit3: Parallel/Group control implemented at CAN2 Bit4: Group control in compatibility with NICE3000 Bit6: Clear floor number and display direction in advance Bit8: Unidirectional hall call (single hall call button) Bit9: Not detecting analog wire breaking Bit10: Err30 judgment at re-leveling cancellation Bit14: Time interval detection of safety circuit 2 and door lock circuit 2 (1.5s)	0	-	★	
F6-10	Leveling switch filter time	10 to 50	14	ms	★	
F6-11	Elevator function selection 2	Bit1: Disabling returning to base floor for verification Bit2: Canceling auto sequential arrange of hall call floor addresses to be displayed Bit5: Current detection valid at startup for synchronous motor Bit6: Reversing MCB lamp output Bit7: Door open valid at non-door zone in the inspection state Bit8: Door open once after the first power-on inspection turned to normal Bit10: Buzzer not tweet upon re-leveling Bit11: Super short floor function Bit13: Err53 fault auto reset Bit14: Up slow-down not reset for super short floor Bit15: Down slow-down not reset for super short floor	8448	-	★	
F6-12	VIP floor	0 to F6-00	0	-	★	P214
F6-13	Security floor	0 to F6-00	0	-	★	
F6-14	Start time of down collective selective 1	00.00 to 23.59	00.00	HH.MM	☆	
F6-15	End time of down collective selective 1	00.00 to 23.59	00.00	HH.MM	☆	
F6-16	Start time of down collective selective 2	00.00 to 23.59	00.00	HH.MM	☆	
F6-17	End time of down collective selective 2	00.00 to 23.59	00.00	HH.MM	☆	
F6-18	Start time of time-based floor service 1	00.00 to 23.59	00.00	HH.MM	☆	P215
F6-19	End time of time-based floor service 1	00.00 to 23.59	00.00	HH.MM	☆	
F6-20	Service floor 1 of time-based floor service 1	0 to 65535	65535	-	☆	
F6-21	Service floor 2 of time-based floor service 1	0 to 65535	65535	-	☆	
F6-22	Start time of time-based floor service 2	00.00 to 23.59	00.00	HH.MM	☆	
F6-23	End time of time-based floor service 2	00.00 to 23.59	00.00	HH.MM	☆	
F6-24	Service floor 1 of time-based floor service 2	0 to 65535	65535	-	☆	
F6-25	Service floor 2 of time-based floor service 2	0 to 65535	65535	-	☆	
F6-26	Peak 1 start time for parallel/ group control	00.00 to 23.59	00.00	HH.MM	☆	
F6-27	Peak 1 end time for parallel/ group control	00.00 to 23.59	00.00	HH.MM	☆	

Function Code	Name	Setting Range	Default	Unit	Property	Page
F6-28	Peak 1 floor	F6-01 to F6-00	1	-	★	P215
F6-29	Peak 2 start time for parallel/ group control	00.00 to 23.59	00.00	HH.MM	☆	
F6-30	Peak 2 end time for parallel/ group control	00.00 to 23.59	00.00	HH.MM	☆	
F6-31	Peak 2 floor	F6-01 to F6-00	1	-	★	
F6-35	Service floors 3	0 to 65535	65535	-	☆	P215
F6-36	Service floor 3 of time-based floor service 1	0 to 65535	65535	-	☆	P216
F6-37	Service floor 3 of time-based floor service 2	0 to 65535	65535	-	☆	
F6-38	Elevator lock start time	00.00 to 23.59	00.00	HH.MM	☆	
F6-39	Elevator lock end time	00.00 to 23.59	00.00	HH.MM	☆	
F6-40	Program control selection 1	Bit0: Disability function Bit1: Soft limit function Bit2: JP16 input used as back door selection Bit3: JP16 input used as the back door open signal Bit4: Opening only one door of opposite doors under manual control Bit5: Timed elevator lock Bit6: Manual door Bit7: Reserved Bit9: Disabling reverse floor number clear Bit10: Displaying next arriving floor number Bit11: Responding to car calls first Bit12: Car call assisted command in single door used as disability function Bit13: Folding command used as disability function and back door function Bit14: Car call command folding Bit15: JP20 used for switchover to back door (switch)	0	-	★	P216 to P219
F6-41	Program control selection 2	Bit2: Inspection to stop due to slow-down Bit4: Buzzer tweet during door open delay Bit6: Canceling door open delay Bit8: Elevator lock at door open Bit9: Display available at elevator lock Bit10: Elevator lock in the attendant state Bit11: Blinking at arrival (within the time set in F6-47) Bit12: Door re-open during door open delay Bit13: Door re-open after car call of the present floor	0	-	★	
F6-42	Program control selection 3	Bit1: Canceling door open/close command at delay after door open/close limit Bit2: Not judging door lock state at door close output Bit3: Door close command output during running Bit4: Returning to base floor for verification at first-time power-on Bit5: Clearing calls immediately at elevator lock Bit6: Electric lock NC Bit8: Canceling door open/close limit detection Bit9: Canceling scrolling display of faults Bit10: Door open energy-saving Bit11: Independent switch separated from parallel connection	0	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
F6-43	Attendant function selection	Bit0: Calls canceled after entering attendant state Bit1: Not responding to hall calls Bit2: Attendant/Automatic state switchover Bit3: Door close at jogging Bit4: Automatic door close Bit5: Buzzer tweeting at intervals in attendant state Bit6: Buzzer tweeting at intervals in attendant state Bit7: Car call button blinking to prompt	128	-	★	P220 to P221
F6-44	Fire emergency function selection	Bit3: Arrival gong output in inspection or fire emergency state Bit4: Multiple car calls registered in fire emergency state Bit5: Retentive at power failure in fire emergency state Bit6: Closing door by holding down the door close button Bit7: Reserved Bit8: Door close at car call registering Bit9: Displaying hall calls in fire emergency state Bit10: Firefighter forced running Bit11: Exiting firefighter state upon arrival at fire emergency floor Bit12: Not clearing car calls at reverse door open in firefighter running state Bit14: Opening door by holding down the door open button Bit15: Automatic door open at fire emergency floor	16456	-	★	
F6-45	Emergency evacuation function selection	Bit0-Bit1: Direction determine mode (00: Automatically calculating direction; 01: Load direction determining; 10: Direction of nearest landing floor) Bit2: Stopping at evacuation parking floor (Otherwise, stopping at the nearest service floor) Bit3: Reserved Bit4: Compensation at startup (Whether to be valid in emergency evacuation running) Bit8: Emergency running time protection Bit10: Emergency buzzer output Bit12: Shorting stator braking mode switched over to controller drive Bit14: Emergency evacuation exit mode (1: Exit at door close limit, 0: Exit at door open limit) Bit15: Shorting stator braking function	0	-	★	P222 to P223
F6-46	VIP function selection	Bit0: VIP enabled by hall call (at VIP floor) Bit1: VIP enabled by terminal Bit8: Number of VIP car calls limited	0	-	★	P223
F6-47	Blinking advance time	0.0 to 15.0	1.0	s	☆	
F6-48	Emergency evacuation switching speed	0.010 to 0.630	0.010	m/s	★	
F6-49	Evacuation parking floor	0 to F6-00	0	-	★	P224
F6-50	Parallel floor offset	0 to 40	0	-	★	
F6-51	Static current	0.00 to 655.00	0	A	★	
F6-52	Program function selection	Bit2: CAN communication AFE support Bit6: CAN communication leveling signal Bit7: Door machine overheat detection	0	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
Group F7: Test function parameters						
F7-00	Car call floor registered	0 to F6-00	0	-	☆	P225
F7-01	Up hall call floor registered	0 to F6-00	0	-	☆	
F7-02	Down hall call floor registered	0 to F6-00	0	-	☆	
F7-03	Random running times	0 to 60000	0	-	☆	
F7-04	Hall call enabled	0: No 1: Yes	0	-	☆	
F7-05	Door open enabled	0: No 1: Yes	0	-	☆	
F7-06	Overload function	0: Disabled 1: Enabled	0	-	☆	P226
F7-07	Limit function	0: Enabled 1: Disabled	0	-	☆	
F7-08	Time interval of random running	0 to 1000	0	s	☆	
F7-09	Braking force test result	O: Insignificant 1: Pass 2: Fail	0	-	●	
F7-10	Countdown for braking force detection period	0 to 1440	1440	min	★	
Group F8: Enhanced function parameters						
F8-00	Load for load cell auto-tuning	0 to 100	0	%	★	P227
F8-01	Pre-torque selection	0: Invalid 1: Load cell pre-torque compensation 2: Automatic pre-torque compensation 3: Weighing pre-torque and automatic compensation both in effect	2	-	★	
F8-02	Pre-torque offset	0.0 to 100.0	50.0	%	★	
F8-03	Drive gain	0.00 to 2.00	0.60	-	★	P228
F8-04	Brake gain	0.00 to 2.00	0.60	-	★	
F8-05	Current car load	0 to 255	0	-	●	
F8-06	Car no-load load	0 to 255	0	-	★	
F8-07	Car full-load load	0 to 255	100	-	★	
F8-08	Anti-nuisance function	0: Anti-nuisance function disabled 1: Nuisance judged by load cell 2: Nuisance judged by light curtain 4: Nuisance judged by light-load signal	0	-	☆	
F8-09	Emergency evacuation operation speed at power failure	0.020 to F3-11	0.050	m/s	★	P229 to P230
F8-10	Emergency evacuation operation mode at power failure	0: Motor not running 1: UPS 2: 48 V battery power supply	0	-	★	
F8-11	Brake release delay	0.200 to 1.500	0.600	s	★	
F8-12	Fire emergency floor 2	0 to F6-00	0	-	★	
F8-14	HCB communication setting	Bit0: HCB communication baud rate Bit4: Energy saving of HCB communication Bit9: Faint light control of HCB buttons	0	-	☆	
F8-15	CAN Communication setting	Bit10: Door open/close button not controlled by the IC card	0	-	☆	
F8-16	Start address of hall call auxiliary command	0 to 40	0	-	☆	
F8-17	Hall call address check	0 to 1	0	-	☆	
Group F9: Time parameters						
F9-00	Idle time before returning to base floor	0 to 240	10	min	☆	P230
F9-01	Car energy-saving time	0 to 240	2	min	☆	
F9-02	Motor running time limit	0 to 45	45	s	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
F9-03	Clock: year	2000 to 2100	Current time	YYYY	☆	P231
F9-04	Clock: month	1 to 12	Current time	MM	☆	
F9-05	Clock: day	1 to 31	Current time	DD	☆	
F9-06	Clock: hour	0 to 23	Current time	HH	☆	
F9-07	Clock: minute	0 to 59	Current time	MM	☆	
F9-09	Accumulative running time	0 to 65535	0	h	●	
F9-11	High byte of running times	0 to 9999	0	-	●	
F9-12	Low byte or running times	0 to 9999	0	-	●	
F9-13	Maintenance notification period	0 to 99	0	day	★	
Group FA: Keypad setting parameters						
FA-00	Keypad display selection	0: Reversed display of physical floor 1: Positive display of physical floor 2: Reversed display of hall call floor 3: Positive display of hall call floor	3	-	☆	P232
FA-01	Display in running state	1 to 65535	65535	-	☆	
FA-02	Display in stop state	1 to 65535	65535	-	☆	P233
FA-03	Current encoder angle	0.0 to 359.9	0.0	Degree (°)	●	P234 to P236
FA-05	MCB board software	0 to 65535	0	-	●	
FA-06	Drive board software	0 to 65535	0	-	●	
FA-07	Heatsink temperature	0 to 100	0	°C	●	
FA-11	Pre-torque current	0.0 to 200.0	0	%	●	
FA-12	Logic information	0 to 65535	0	-	●	
FA-13	Curve information	0 to 65535	0	-	●	P236 to P237
FA-14	Set speed	0.000 to 4.000	0	m/s	●	
FA-15	Feedback speed	0.000 to 4.000	0	m/s	●	
FA-16	Bus voltage	0 to 999.9	0	V	●	
FA-17	Current position	0.0 to 300.0	0	m	●	
FA-18	Output current	0.0 to 999.9	0	A	●	
FA-19	Output frequency	0.00 to 99.99	0	Hz	●	
FA-20	Torque current	0.0 to 999.9	0	A	●	
FA-21	Output Voltage	0 to 999.9	0	V	●	
FA-22	Output torque	0 to 100	0	%	●	
FA-23	Output power	0.00 to 99.99	0	kW	●	
FA-24	Communication interference	0 to 65535	0	-	●	
FA-26	Input state 1	0 to 65535	0	-	●	P237 to P240
FA-27	Input state 2	0 to 65535	0	-	●	
FA-28	Input state 3	0 to 65535	0	-	●	
FA-30	Input state 5	0 to 65535	0	-	●	
FA-31	Output state 1	0 to 65535	0	-	●	
FA-32	Output state 2	0 to 65535	0	-	●	
FA-33	Car input state	0 to 65535	0	-	●	P240
FA-34	Car output state	0 to 65535	0	-	●	
FA-35	Hall sate	0 to 65535	0	-	●	P241
FA-36	System state 1	0 to 65535	0	-	●	
FA-37	System state 2	0 to 65535	0	-	●	
FA-38	Maximum floor running time interval	0 to 200	0	s	●	P242
FA-46	Hall call communication state 1	0–65535 (floors 1–16)	0	-	●	P242
FA-47	Hall call communication state 2	0–65535 (floors 17–32)	0	-	●	
FA-48	Hall call communication state 3	0–65535 (floors 33–40)	0	-	●	
FA-50	Expansion board hall call communication state 1	0–65535 (floors 1–16)	0	-	●	
FA-51	Expansion board hall call communication state 2	0–65535 (floors 17–32)	0	-	●	
FA-52	Expansion board hall call communication state 3	0–65535 (floors 33–40)	0	-	●	

Function Code	Name	Setting Range	Default	Unit	Property	Page
FA-58	Version display selection	0: Machine-room-less monitoring board version 1: Equipment room expansion board version 2: Car expansion board version 3: ARD version 4: AFE master version 5: AFE slave version	0	-	☆	P243
FA-59	Expansion board software version	0 to 65535	0	-	●	
Group Fb: Door function parameters						
Fb-00	Number of door machine(s)	1 to 2	1	-	★	P243
Fb-01	CTB software	00 to 999	0	-	●	
Fb-02	Door machine 1 service floors 1	0 to 65535	65535	-	☆	P244
Fb-03	Door machine 1 service floors 2	0 to 65535	65535	-	☆	
Fb-04	Door machine 2 service floors 1	0 to 65535	65535	-	☆	
Fb-05	Door machine 2 service floors 2	0 to 65535	65535	-	☆	
Fb-06	Door open protection time	5 to 99	10	s	☆	
Fb-07	Arrival gong output delay	0 to 1000	0	ms	☆	
Fb-08	Door close protection time	5 to 99	15	s	☆	
Fb-09	Door open/close protection times	0 to 20	0	-	☆	P245
Fb-10	Door state of standby elevator	0: Closing the door as normal at base floor 1: Waiting with door open at base floor 2: Waiting with door open at each floor	0	-	☆	
Fb-11	Door open holding time for hall call	1 to 1000	5	s	☆	
Fb-12	Door open holding time for car call	1 to 1000	3	s	☆	
Fb-13	Door open holding time at base floor	1 to 1000	10	s	☆	
Fb-14	Door open delay	10 to 1000	30	s	☆	
Fb-15	Special door open holding time	10 to 1000	30	s	☆	P246
Fb-16	Manual door open holding time	1 to 60	5	s	☆	
Fb-17	Holding time for forced door close	5 to 180	120	s	☆	
Fb-18	Door machine 1 service floors 3	0 to 65535	65535	-	☆	
Fb-19	Door machine 2 service floors 3	0 to 65535	65535	-	☆	
Fb-20	Manual door lock waiting time	0 to 60	0	-	☆	
Fb-24	UCMP test program version	0 to 65535	1	-	●	
Group FC: Protection function parameters						
FC-00	F5-33 Program control selection	Bit0: Detection of short circuit to ground at power-on Bit2: Decelerating to stop at valid light curtain Bit9: Mode without door open/close limit	0	-	★	P246 to P247
FC-01	Function selection	Bit0: Overload protection Bit1: Canceling protection at output phase loss Bit4: Light curtain judgment at door close limit Canceling DSP communication test Bit14: Canceling protection at input phase loss	65	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
FC-02	Overload protection coefficient	0.50 to 10.00	1.00	-	★	P248
FC-03	Overload pre-warning coefficient	50 to 100	80	%	★	
FC-04	Opposite door selection	0 to 3	0	-	★	
FC-11	11th fault code	0 to 9999	0	-	●	
FC-12	11th fault subcode	0 to 65535	0	-	●	
FC-13	11th fault month and day	0 to 1231	0	MM.DD	●	
FC-14	11th fault hour and minute	0 to 23.59	0	HH.MM	●	
FC-15	12th fault code	0 to 9999	0	-	●	
FC-16	12th fault subcode	0 to 65535	0	-	●	
FC-17	12th fault month and day	0 to 1231	0	MM.DD	●	
FC-18	12th fault hour and minute	0 to 23.59	0	HH.MM	●	
FC-19	13th fault code	0 to 9999	0	-	●	
FC-20	13th fault subcode	0 to 65535	0	-	●	
FC-21	13th fault month and day	0 to 1231	0	MM.DD	●	
FC-22	13th fault hour and minute	0 to 23.59	0	HH.MM	●	
FC-23	14th fault code	0 to 9999	0	-	●	
FC-24	14th fault subcode	0 to 65535	0	-	●	
FC-25	14th fault month and day	0 to 1231	0	MM.DD	●	
FC-26	14th fault hour and minute	0 to 23.59	0	HH.MM	●	
FC-27	15th fault code	0 to 9999	0	-	●	P248 to P249
FC-28	15th fault subcode	0 to 65535	0	-	●	
FC-29	15th fault month and day	0 to 1231	0	MM.DD	●	
FC-30	15th fault hour and minute	0 to 23.59	0	HH.MM	●	
FC-31	16th fault code	0 to 9999	0	-	●	
FC-32	16th fault subcode	0 to 65535	0	-	●	
FC-33	16th fault month and day	0 to 1231	0	MM.DD	●	
FC-34	16th fault hour and minute	0 to 23.59	0	HH.MM	●	
FC-207	60th fault code	0 to 9999	0	-	●	
FC-208	60th fault subcode	0 to 65535	0	-	●	
FC-209	60th fault month and day	0 to 1231	0	MM.DD	●	
FC-210	60th fault hour and minute	0 to 23.59	0	HH.MM	●	
Group Fd: Communication parameters						
Fd-00	Baud rate	0: 9600 1: 38400	1	-	★	P249
Fd-02	Local address	0 to 127	1	-	★	
Fd-03	Communication response delay	0 to 20	0	ms	★	
Fd-04	Communication timeout	0 to 60.0	0.0	s	★	
Fd-05	Re-leveling stop delay	0.00 to 2.00	0.00	s	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
Fd-07	HCB: JP1 input	0: Invalid 1: Elevator lock signal 2: Fire emergency signal 3: Present floor forbidden 4: VIP floor signal 5: Security floor signal 6 Door close button signal 7: Second fire emergency floor signal	1	-	★	P250
Fd-08	HCB: JP2 input		2	-	★	
Fd-09	HCB: JP1 output	0: Invalid 1: Up arrival indicator 2: Down arrival indicator 3: Fault output 4: Non-door zone stop output 5: Non-service state output 6: Door close button indicator output	1	-	★	
Fd-10	HCB: JP2 output		2	-	★	
Fd-11	Expansion board 1: X1 input	0: Reserved 1: Fire emergency signal 2: Overload signal 3: Full-load signal 4: Firefighter operation 5: Door machine 1 light curtain signal 6: Door machine 2 light curtain signal 7: Brake travel switch feedback 8: UPS valid signal 9: Elevator lock signal 10: Safety circuit signal 2 11: Synchronous motor self-lock feedback 12: Door lock circuit 2 feedback 13: Door machine 1 safety edge signal 14: Door machine 2 safety edge signal 15: Motor overheat signal # 16: Earthquake signal 17: Back door forbidden # 18: Light-load signal # 19: Half-load signal # 20: Fire emergency floor switchover 21: False floor signal 22: Door 1 open 23: Door 2 open 24: Brake travel switch 2 feedback 25: External fault 26: End floor signal 27: Door 2 selection 28: Single/Double door selection NO input NC point + 32	0	-	★	P251
Fd-12	Expansion board 1: X2 input		0	-	★	
Fd-13	Expansion board 1: X3 input		0	-	★	
Fd-14	Expansion board 1: X4 input		0	-	★	
Fd-15	Expansion board 1: X5 input		0	-	★	
Fd-16	Expansion board 1: X6 input		0	-	★	
Fd-17	Expansion board 1: X7 input		0	-	★	
Fd-18	Expansion board 1: X8 input		0	-	★	
Fd-19	Expansion board 1: X9 input		0	-	★	
Fd-20	Expansion board 1: X10 input		0	-	★	
Fd-21	Expansion board 2: X1 input		0	-	★	
Fd-22	Expansion board 2: X2 input		0	-	★	
Fd-23	Expansion board 2: X3 input		0	-	★	
Fd-24	Expansion board 2: X4 input		0	-	★	
Fd-25	Expansion board 2: X5 input		0	-	★	
Fd-26	Expansion board 2: X6 input		0	-	★	
Fd-27	Expansion board 2: X7 input		0	-	★	
Fd-28	Expansion board 2: X8 input		0	-	★	
Fd-29	Expansion board 2: X9 input		0	-	★	
Fd-30	Expansion board 2: X10 input		0	-	★	

Function Code	Name	Setting Range	Default	Unit	Property	Page
Fd-31	Expansion board 1: Y1 output	0: Reserved 1: Door machine 1 open 2: Door machine 1 close 3: Door machine 2 open 4: Door machine 2 close 5: Brake and RUN contactors healthy (no faults E37 and E36) 6: Fault state 7: Running monitoring 8: Synchronous motor self-lock output 9: Controller healthy 10: Buzzer tweet 11: Higher-voltage startup of brake (continuous 4s) 12: Elevator running in up direction 13: Lamp/Fan running 14: Medical sterilization # 15: Non-door zone stop # 16: Electric lock # 17: Non-service state 18: Emergency evacuation completed 19: Fire emergency operation 20: Power failure emergency output 21: Door lock valid 22: Night output signal	0	-	★	P252
Fd-32	Expansion board 1: Y2 output		0	-	★	
Fd-33	Expansion board 1: Y3 output		0	-	★	
Fd-34	Expansion board 1: Y4 output		0	-	★	
Fd-35	Expansion board 1: Y5 output		0	-	★	
Fd-36	Expansion board 1: Y6 output		0	-	★	
Fd-37	Expansion board 1: Y7 output		0	-	★	
Fd-38	Expansion board 1: Y8 output		0	-	★	
Fd-39	Expansion board 1: Y9 output		0	-	★	
Fd-40	Expansion board 1: Y10 output		0	-	★	
Fd-41	Expansion board 2: Y1 output		0	-	★	
Fd-42	Expansion board 2: Y2 output		0	-	★	
Fd-43	Expansion board 2: Y3 output		0	-	★	
Fd-44	Expansion board 2: Y4 output		0	-	★	
Fd-45	Expansion board 2: Y5 output		0	-	★	
Fd-46	Expansion board 2: Y6 output		0	-	★	
Fd-47	Expansion board 2: Y7 output		0	-	★	
Fd-48	Expansion board 2: Y8 output		0	-	★	
Fd-49	Expansion board 2: Y9 output		0	-	★	
Fd-50	Expansion board 2: Y10 output		0	-	★	
Group FE: Elevator function parameters						
FE-00	Collective selective mode	0: Full collective selective 1: Down collective selective 2: Up collective selective	0	-	★	P253

Function Code	Name	Setting Range	Default	Unit	Property	Page
FE-01	Floor 1 display	The two high digits indicate the display code of the ten's digit, and the two low digits indicate the display code of the unit's digit. The relation between the code and the display is as follows: 00: Display "0" 01: Display "1" 02: Display "2" 03: Display "3" 04: Display "4" 05: Display "5" 06: Display "6" 07: Display "7" 08: Display "8" 09: Display "9" 10: Display "A" 11: Display "B" 12: Display "G" 13: Display "H" 14: Display "L" 15: Display "M" 16: Display "P" 17: Display "R" 18: Display "-" 19: No display 20: Display "12" 21: Display "13" 22: Display "23" 23: Display "C" 24: Display "D" 25: Display "E" 26: Display "F" 27: Display "I" 28: Display "J" 29: Display "K" 30: Display "N" 31: Display "O" 32: Display "Q" 33: Display "S" 34: Display "T" 35: Display "U" 36: Display "V" 37: Display "W" 38: Display "X" 39: Display "Y" 40: Display "Z" 41: Display "15" 42: Display "17" 43: Display "19"	1901	-	☆	P253
FE-02	Floor 2 display		1902	-	☆	
FE-03	Floor 3 display		1903	-	☆	
FE-04	Floor 4 display		1904	-	☆	
FE-05	Floor 5 display		1905	-	☆	
FE-06	Floor 6 display		1906	-	☆	
FE-07	Floor 7 display		1907	-	☆	
FE-08	Floor 8 display		1908	-	☆	
FE-09	Floor 9 display		1909	-	☆	
FE-10	Floor 10 display		0100	-	☆	
FE-11	Floor 11 display		0101	-	☆	
FE-12	Floor 12 display		0102	-	☆	
FE-13	Floor 13 display		0103	-	☆	
FE-14	Floor 14 display		0104	-	☆	
FE-15	Floor 15 display		0105	-	☆	
	Floor 16 to 30 display		...			
FE-31	Floor 31 display		0301	-	☆	
FE-35	Floor 32 display		0302	-	☆	
FE-36	Floor 33 display		0303	-	☆	
FE-37	Floor 34 display		0304	-	☆	
FE-38	Floor 35 display		0305	-	☆	
FE-39	Floor 36 display		0306	-	☆	
FE-40	Floor 37 display		0307	-	☆	
FE-41	Floor 38 display		0308	-	☆	
FE-42	Floor 39 display		0309	-	☆	
FE-43	Floor 40 display		0400	-	☆	
FE-52	Highest digit selection 1		0	-	☆	P254
FE-53	Highest digit selection 2		0	-	☆	
FE-54	Highest digit selection 3		0	-	☆	
FE-55	Highest digit selection 4		0	-	☆	
FE-56	Highest digit selection 5		0	-	☆	
FE-32	Elevator function selection 1	Bit2: Re-leveling function Bit3: Door pre-open function Bit4: Stuck hall call cancellation Bit5: Night security floor function Bit6: Down collective selective peak service Bit7: Parallel/Group control peak service Bit8: Time-based service floor function Bit9: VIP function Bit11: Car call deletion Bit12: Reserved	34816	-	☆	P254 to P255

Function Code	Name	Setting Range	Default	Unit	Property	Page
FE-33	Elevator function selection 2	Bit1: Door open holding at open limit Bit2: Door close command not output upon door close limit Bit4: Auto reset for RUN and brake contactor stuck Bit5: Slow-down switch stuck detection Bit7: Forced door close Bit15: Opposite door independent control	36	-	☆	P255 to P256
FF: Factory Parameters						
FJ: Factory Parameters						
Group FP: User parameters						
FP-00	User password	0: No password 01 to 65535	0	-		P257
FP-01	Parameter update	0: No operation 1: Restore default setting (except group F1) 2: Clear fault records 3: Clear shaft data	0	-		
FP-02	User-defined parameter display	0: Invalid 1: Valid	0	-		
FP-05	Contract No. 2	0 to 65535	0	-		P258
FP-06	Contract No. 1	0 to 65535	5555	-		
Group Fr: Leveling adjustment parameters						
Fr-00	Leveling adjustment function	0: Invalid 1: Enabled	0	-		P258 to P259
Fr-01	Leveling adjustment record 1	0 to 60060	30030	mm		
to	to	0 to 60060	30030	mm		
Fr-20	Leveling adjustment record 20	0 to 60060	30030	mm		
Group E0: Details of last group of faults						
E0-00	Last fault code	0 to 9999	0			P259 to P260
E0-01	Last fault subcode	0 to 65535	0			
E0-02	Last fault month and day	0 to 1231	0	MM.DD		
E0-03	Last fault hour and minute	0 to 23.59	0	HH.MM		
E0-04	Last fault logic information	0 to 65535	0			
E0-05	Last fault curve information	0 to 65535	0			
E0-06	Speed reference upon last fault	0.000 to 4.000	0	m/s		
E0-07	Feedback speed upon last fault	0.000 to 4.000	0	m/s		
E0-08	Bus voltage upon last fault	0 to 999.9	0	V		
E0-09	Present position upon last fault	0.0 to 300.0	0	m		
E0-10	Output current upon last fault	0.0 to 999.9	0	A		
E0-11	Output frequency upon last fault	0.00 to 99.99	0	Hz		
E0-12	Torque current upon last fault	0.0 to 999.9	0	A		
E0-13	Output voltage upon last fault	0 to 999.9	0	V		
E0-14	Output torque upon last fault	0 to 200.0	0	%		
E0-15	Output power upon last fault	0.00 to 99.99	0	kW		P261
E0-16	Communication interference upon last fault	0 to 65535	0			
E0-17	Encoder interference upon last fault	0 to 65535	0			
E0-18	Input state 1 upon last fault	0 to 65535	0			
E0-19	Input state 2 upon last fault	0 to 65535	0			
E0-20	Input state 3 upon last fault	0 to 65535	0			
E0-21	Input state 4 upon last fault	0 to 65535	0			
E0-22	Input state 5 upon last fault	0 to 65535	0			
E0-23	Output state 1 upon last fault	0 to 65535	0			
E0-24	Output state 2 upon last fault	0 to 65535	0			
E0-25	Car input state upon last fault	0 to 65535	0			
E0-26	Car output state upon last fault	0 to 65535	0			
E0-27	Hall call state upon last fault	0 to 65535	0			
E0-28	System state 1 upon last fault	0 to 65535	0			P260
E0-29	System state 2 upon last fault	0 to 65535	0			

Function Code	Name	Setting Range	Default	Unit	Property	Page
E9-00	10th fault code	0 to 9999	0			P260 to P261
E9-01	10th fault subcode	0 to 65535	0			
E9-02	10th fault month and day	0 to 1231	0	MM.DD		
E9-03	10th fault hour and minute	0 to 23.59	0	HH.MM		
E9-04	10th fault logic information	0 to 65535	0			
E9-05	10th fault curve information	0 to 65535	0			
E9-06	Speed reference upon 10th fault	0.000 to 4.000	0	m/s		
E9-07	Feedback speed upon 10th fault	0.000 to 4.000	0	m/s		
E9-08	Bus voltage upon 10th fault	0 to 999.9	0	V		
E9-09	Present position upon 10th fault	0.0 to 300.0	0	m		
E9-10	Output current upon 10th fault	0.0 to 999.9	0	A		
E9-11	Output frequency upon 10th fault	0.00 to 99.99	0	Hz		
E9-12	Torque current upon 10th fault	0.0 to 999.9	0	A		
E9-13	Output voltage upon 10th fault	0 to 999.9	0	V		
E9-14	Output torque upon 10th fault	0 to 200.0	0	%		
E9-15	Output power upon 10th fault	0.00 to 99.99	0	kW		
E9-16	Communication interference upon 10th fault	0 to 65535	0			P261
E9-17	Encoder interference upon 10th fault	0 to 65535	0			
E9-18	Input state 1 upon 10th fault	0 to 65535	0			
E9-19	Input state 2 upon 10th fault	0 to 65535	0			
E9-20	Input state 3 upon 10th fault	0 to 65535	0			
E9-21	Input state 4 upon 10th fault	0 to 65535	0			
E9-22	Input state 5 upon 10th fault	0 to 65535	0			
E9-23	Output state 1 upon 10th fault	0 to 65535	0			
E9-24	Output state 2 upon 10th fault	0 to 65535	0			
E9-25	Car input state upon 10th fault	0 to 65535	0			
E9-26	Car output state upon 10th fault	0 to 65535	0			
E9-27	Hall call state upon 10th fault	0 to 65535	0			
E9-28	System state 1 upon 10th fault	0 to 65535	0			
E9-29	System state 2 upon 10th fault	0 to 65535	0			

Appendix C Revision History

Date	Version	Revision
June 2022	A04	Update the phase number, voltage and frequency of the input power supply in the technical specification table.
March 2022	A03	Update terminal names in the I/O expansion board MCTC-KZ-G1 section; Update front and back cover style.
November 2020	A02	Made minor corrections.
November 2018	A01	Updated logo.
May 2018	A00	First issue.

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