Monarch

NICE3000new
Integrated Elevator Controller

Suzhou MONARCH Control Technology Co., Ltd.

NICE3000new
Integrated Elevator Controller
User Manual V1.1

Data code: 19010185

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. Strictly follow the notices when using the product. Monarch 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 for typical applications and may not match your actual application.
- 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.

◆ Copyright

Preface

◆ About This Manual

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

◆ Latest Use Information

For latest use information of our product, visit our website or send emails to us.

Website: http://www.szmctc.com

Email: UM@inovance.cn

◆ Product Introduction

Overview

Monarch NICE3000^{new} is a new-generation integrated elevator controller independently developed and manufacturered by Suzhou MONARCH Control Technology Co., Ltd., by optimizing the NICE3000 controller based on a large number of applications and combining new industrial features.

The NICE3000^{new} integrated elevator controller (shorted as "NICE3000^{new}" or "controller" hereinafter) has the following advantages:

- It supports high-performance vector control and open-loop low speed running. It can drive both AC asynchronous motor and permanent magnetic synchronous motor (PMSM), and implement switchover between the two types of motors easily by modifying only one parameter.
- It supports direct parallel control of two elevators and group control of multiple elevators, and supports the CANbus and Modbus communication protocols for remote monitoring, which reduces the required quantity of travling cables.
- It supports a maximum of 40 floors and is widely applied to elevators used in the residence, office buildings, shopping centers, and hospitals.
- It adopts the distance-based direct stop technology, with N curves generated automatically, achieving convenient and comfortable riding.
- It provides multiple commissioning tools, onboard keypad, operation panel, and host computer monitoring software (NEMS), making inspection, commissioning, and maintenance of the elevator easy and convenient.

◆ Function List

1. Basic functions

Function	Description	Remarks
Common Running Functions		
Integrated control for synchronous and asynchronous motors	The NICE3000new can drive both AC asynchronous motor and PMSM.	Switchover between the two types of motors easily by modifying F1-25
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 delay	In automatic running state, passengers can press the door open button in the car to delay door open to facilitate goods to be moved in or out.	Fb-14 (Door open holding time at such signal input)
Door machine service floor setting	You can set the required service floors of the door machines.	Fb-02, Fb-03, Fb-04, Fb-05
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.	Refer to section 6.2.4
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, they can 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.	MCTC-CHM required
Auto-leveling	The systems 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.	-
Down collective selective control	In automatic running or attendant state, the elevator responds only to hall down calls besides car calls.	-

Function	Description	Remarks
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, F6-06, F6-35
Time-based floor service	You can flexibly set the time periods and corresponding service floors or select the service floors by using the service floor switchover switch.	-
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.	-
Hall arrival gong	After the elevator will arrive at the destination floor soon, the system outputs the hall arrival gong.	-
Hall I/O extension function	If the hall I/O terminals are not sufficient, more terminals can be provided by using an HCB-B board.	HCB output
Car I/O extension function	If the car I/O terminals are not sufficient, more terminals can be provided by using an HCB-B board.	HCB output
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.	-
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.	-

Function	Description	Remarks
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.	-
Service suspension output	When the elevator cannot respond to hall calls, the corresponding terminal outputs the service suspension signal.	Recorded in F9-05 and F9-06
Running times recording	In automatic running state, the system automatically records the running times of the elevator.	Recorded in F9-09
Running time recording	The system automatically records the accumulative power-on time, working hours, and working days of the elevator.	Fb-09 (Door open/ close protection times)
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.	-
VIP service	The elevator first directly runs to the VIP floor and provides services for special persons.	Refer to section 6.1.5
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, the elevator alarms and stops running.	
Fault data recording	The system automatically records detailed information of faults, which helps improve the efficiency of maintenance and repair.	Group FC
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.	Refer to section 5.1
Operation box commissioning	The operation panel 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. During shaft auto-tuning, the elevator runs from the bottom floor to the top floor at the inspection speed and automatically records all position signals in the shaft.	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.	-
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.	Refer to section 6.1.3
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.	-

Function	Description	Remarks
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 running	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.	Refer to chapter 9
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.	-
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.	-

Function	Description	Remarks
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 cancelled in ramp mode, preventing abnormal noise during current cancellation.	-
Independent working power supply	The NICE3000new 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 control	The system supports parallel control of two elevators and provides multiple scheduling algorithms to meet requirements of different customers.	Refer to section 6.2.3
Dispersed waiting	In parallel/group control, the elevators can wait at different floors.	Set in 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 in the car and compares it with the number of registered car calls. If there are excessive car calls, the system determines that it is nuisance and cancels all car calls. In this case, passengers need to register correct car calls again.	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.	-
Interface for intelligent residential management	The system provides an interface for intelligent residential management to perform remote monitoring on the state of elevators in the residential district.	Residential monitoring board MCTC-MIB required
Parameter copy	You can upload and download parameters by using the operation panel MDKE6.	MDKE6 operation panel required
Energy-saving Functions		
Car energy-saving	If there is no running command within the set time, 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)

Function	Description	Remarks
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.	-
Energy-saving of idle door machine	After the car lamp is turned off, the system does not output the door close command, which reduces power consumption of the door machine.	-

2. Optional functions

Function	Description	Remarks
Door pre-open	During normal stop, when the elevator speed is smaller than 0.2 m/s 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.	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 in and out of passengers and goods. In this case, the system allows the elevator to run to the leveling position in the door open state at the leveling speed.	MCTC-SCB required
Power failure emergency evacuation	For the elevator configured with standby power supply, the system uses the standby power supply to implement low-speed self-rescue in the case of power failure.	Standby power supply required
Onsite commissioning	The system can control and monitor running of elevators by using the NEMS software.	NEMS software required
Commissioning by cell phone	The Android cell phone can be connected to the controller through the external Bluetooth module, and you can commission and monitor the elevator, and upload and download parameters by using the cell phone. The software does not supporting English version currently.	Special Bluetooth module (MCTC-BTM-A) and cell phone host EDSAP 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, accessories, and MCTC-MIB required
IC card	Passengers need to use the IC card to go to floors that require authorization.	IC card required

Contents

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Safety Instructions

Chapter 1 Safety Instructions

This manual includes notices you have to observe in order to ensure your personal safety and prevent damage to property. These notices shown below are graded according to the degree of danger.

Read the following safety notices carefully so that you understand how to install, commission, operate and maintain the equipment. Monarch assumes no liability or responsibility for any injury or loss caused by improper operation of the equipment described in the manual.

1

DANGER

It indicates that failure to comply with the notice will result in severe personal injury or even death.

WARNING

It indicates that failure to comply with the notice may result in severe personal injury or even death.

CAUTION

It indicates that failure to comply with the notice may result in minor or moderate personal injury or damage to the equipment.

1.1 General Safety

1. General

DANGER

■ To Prevent Electric Shock

- Do not wire the controller while the power is on. Cut off all power supplies and wait for at least ten minutes before any checking work so that the residual voltage on capacitors can discharge safely.
- Always ensure that the controller is tied to ground well because the contact current of the controller is larger than 3.5 mA.

WARNING

■ To Prevent Sudden Movement

In certain conditions, the motor may start accidentally once the power is applied, resulting in severe personal injury or even death. Before applying power, confirm that the application allows the motor to run or there is setting for forbidding automatic running of the motor.

■ To Prevent Electric Shock

- NEVER modify or refit the controller. Monarch will assume no liability or responsibility for any modification or refitting.
- Do not allow unqualified personnel to perform any maintenance, inspection or part replacement work.
- Do not remove the cover or touch the PCB of the controller.

■ To Prevent Fire

Always confirm the rated voltage of the controller matches the power voltage before applying the power. Incorrect power voltage of the main circuit may result in a fire.

CAUTION

■ To Prevent Personal Injury

- Never transporting the controller by carrying the front cover. Otherwise, the main body of the controller may fall off, resulting in personal injury.
- Always handle the controller with care.
- Do not use the controller if there are damaged or missing parts.

■ To Prevent Damage to the Equipment

- Follow the proper electrostatic discharge (ESD) procedures when operating the controller.

  Failure to comply will damage the internal circuit of the controller.
- Do not perform a voltage resistance test on any part of the controller.

  Such test has been done in the factory. If you do this test, the high voltage during the test may damage the sensitive parts inside the controller.
- Do not power on or operate the controller that has been damaged or has any missing part.

  Failure to comply may cause further damage.
- Perform short circuit protection according to local code.

  Failure to comply may damage the controller. The controller is applicable to the circuit capable of short circuit current below 100 kA and 440 VAC maximum voltage (400 V class).

■ To Reduce Interference

Do not install devices such as transformer that generate electromagnetic wave or interference surrounding the controller.

Failure to comply may result in unexpected action of the controller. If it is necessary to install such a device, install a shield plate between the device and the controller.

■ To Prevent Malfunction

- Do not share grounding cable with welding machines or electrical equipment that requires heavy current. Failure to comply may result in malfunction of the controller or other equipment.
- When using multiple controllers, ground them properly according to the instructions in this manual. Improper grounding may result in malfunction of the controller or other equipment.

2. Before Installation

DANGER

- Do not install the equipment if you find water seepage, component missing or damage upon unpacking.
- Do not install the equipment if the packing list does not conform to the product you receive.

3. During Installation

DANGER

Do not loosen the fixed screws of the components, especially the screws with red mark.

WARNING

- NEVER connect power cables to the output terminals (U, V, W) of the controller. Identify the marks of the cable terminals carefully, and make sure you complete all connections correctly.
- NEVER connect the regen. resistor between the DC bus terminals (+) and (-).
- Use a shielded cable for connection to the encoder, and make sure that the shield is tied to ground reliably.

4. During Electrical Connections

DANGER

- Connect the output terminals (U, V, W) of the controller respectively to the input terminals (U, V, W) of the motor. Make sure to keep their phase sequence consistent. Inconsistent phase sequence will result in reverse rotation of the motor.
- NEVER connect power cables to the output terminals of the controller. Failure to comply will result in damage to the controller or even a fire.

5. After Power-on

DANGER

- Do not open or remove the protective cover of the controller after power-on.
- NEVER touch any of the input/output terminals of the controller.

CAUTION

- NEVER touch the rotating part of the motor during motor auto-tuning or while the motor is running.
- Do not change the default settings of the controller.

6. During Operation

DANGER

- Do not allow unqualified personnel to perform signal detection during operation.
- Do not touch the fan or the discharging resistor. Otherwise, you may get burnt.
- Signal measurements must be made only by a qualified technician.

CAUTION

- Prevent objects falling into the controller.
- Follow the correct procedures described in this user manual to start and to stop the controller. Do not start or stop the controller by using the contactor.

7. During Maintenance

DANGER

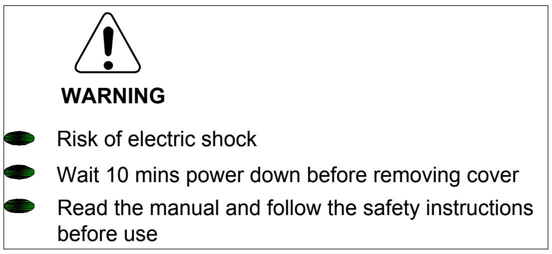
- Repair and maintenance operations on the controller must be performed only by qualified technicians.
- Never repair or main the controller while the power is on. Follow the repair and maintenance instructions in this user manual.
- Repair or maintain the controller when its voltage is lower than 36 VAC, about 10 minutes after the controller is powered off. Otherwise, the residual voltage in the capacitor may result in personal injury.
- Disconnect the controller from all power supply before starting any repair or maintenance operations.
- All the pluggable components must be plugged or removed only after power-off.
- Perform parameter setting and check after the controller is replaced.

WARNING

The rotating motor feeds power back to the controller system. The controller is still charged even if the motor stops and the power is cut off. Therefore, ensure that the motor is completely disconnected from the controller before starting any maintenance on the controller.

◆ Controller Label Warnings

The controller labels the warning information on the front or terminal cover. Obey the warning information during the use.



◆ Restrictions

- The controller is not designed or manufactured for use in devices or systems that may directly affect or threaten human lives or health.
- Customers who intend to arrange the controller for special use such as device or system relating to health care, space aviation, nuclear energy, electric power, or in underwater applications must contact our agent or sales representatives.
- The controller has been manufactured under strict quality control. However, if this product is to be installed in any location where the fault of this product may result in a severe accident or loss, install safety devices.

1.2 Supplementary Precautions

1. Requirements of a residual current device (RCD)

The controller generates high leakage current during running, which flows through the protective earthing (PE) 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 controller. You can select an RCD specialized for suppressing high harmonics or a general-purpose RCD of 300 mA ($I_{\Delta n}$ is two to four times of protective conductor current).

2. Motor insulation test

Perform an insulation test on the motor under the following conditions:

- Before the motor is used for the first time
- When the motor is reused after being stored for a long time
- During periodic inspection

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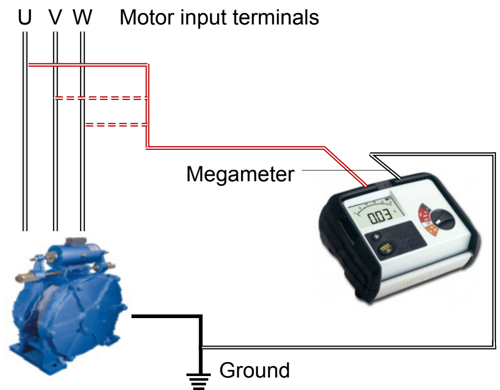
This is to prevent poor insulation of motor windings from damaging the controller. The motor must be disconnected from the controller during the insulation test. A 500-volt megameter is recommended for this test, and the insulation resistance must not be less than 5 MΩ.



3. Thermal protection of the motor

If the rated capacity of the motor selected does not match that of the controller, especially when the rated power of the controller is greater than that of the motor, adjust the motor protection parameters on the operation panel of the controller or install a thermal relay for the motor circuit for protection.

4. Running at above mains frequency

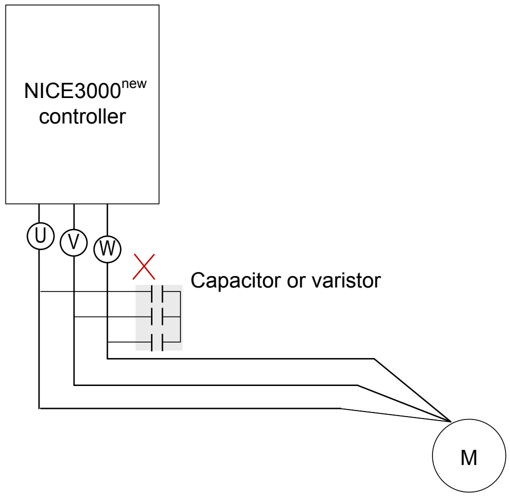
The controller can output frequency in the range 0 to 99 Hz. If it is necessary to operate the controller at frequency higher than the mains frequency (generally 50 Hz), consider the capacity of the machine.

5. Motor heat and noise

The output of the controller is pulse width modulation (PWM) wave with certain harmonic wave, and therefore, the motor temperature rise, noise, and vibration are slightly greater than those at running with the mains frequency.

6. Voltage-sensitive device or capacitor on the output side of the controller

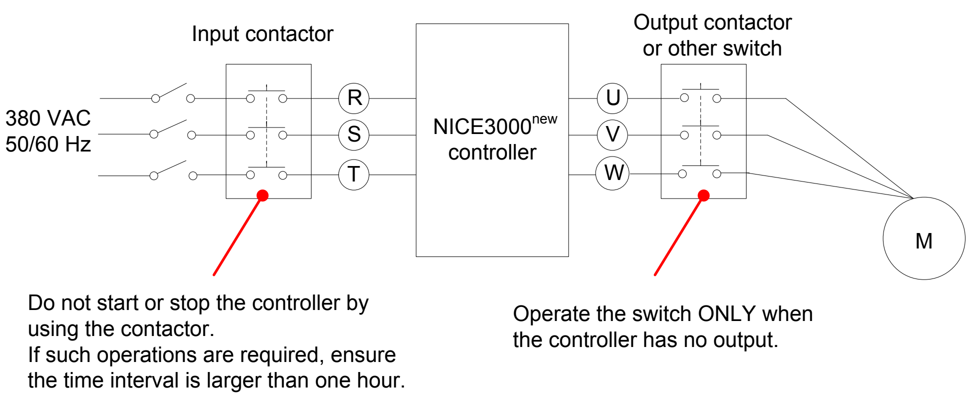
The controller outputs PWM waves, and therefore, do not install the capacitor for improving power factor or lightning protection voltage-sensitive resistor on the output side of the controller. Otherwise, the controller may suffer transient overcurrent or even be damaged.



7. Switch (contactor) on the input and output sides of the controller

If a contactor is installed between the power supply and the input side of the controller, DO NOT use it to start or stop the controller. However, if there is a need to use the contactor to start or to stop the controller, make sure the time interval between switching is at least one hour. If the interval between switching is shorter than one hour, this will reduce the service life of the capacitor inside the controller.

If a switch such as contactor is installed between the output side of the controller and the motor, operate the switch only when the controller has no output. Otherwise, modules inside the controller may be damaged.



8. Use outside the rated voltage

The controller must not be used outside the allowable voltage range specified in this manual. Otherwise, components inside the controller may be damaged. If required, use a corresponding voltage step-up or step-down device to match the power voltage to the rated voltage range for the controller.

9. Changing three-phase input to two-phase input

The three-phase input is required for the 400-V class controller during normal use. The two-phase 380 V or 220 V input is allowed ONLY during emergency evacuation.

The 200-V class controller can be used properly in either three-phase input or two-phase input. However, the rated output power of the controller differs from the input voltage; this affects selection of the adaptable motor, and pays special attention.

10. Surge suppressor

The controller has a built-in varistor for suppressing the surge voltage generated when the inductive loads (electromagnetic contactor, electromagnetic relay, solenoid valve, electromagnetic coil and electromagnetic brake) around the controller are switched on or off. If the inductive loads generate very high surge voltage, use a surge suppressor for the inductive load or use a surge suppressor together with a diode.

NOTE

Do not connect the surge suppressor at the output side of the controller.

11. Altitude and de-rating

In places where the altitude is above 1000 m and the cooling effect reduces due to thin air, it is necessary to de-rate the controller (see section 10.2 for details. Contact us for technical support).

12. Disposal

The electrolytic capacitors on the main circuits and PCB may explode when they are burnt. Poisonous gas is generated when the plastic parts are burnt. Treat them as ordinary industrial waste.

13. Adaptable motor

The standard adaptable motor is an adaptable four-pole squirrel cage asynchronous induction motor. For other types of motor, select the correct controller according to the rated motor current.

The cooling fan and rotor shaft of non-variable-frequency motors are coaxial, which results in reduced cooling effect when the motor speed reduces. If variable speed is required, add a more powerful fan or fit a variable-frequency motor in applications where the motor overheats easily.

The standard parameters of the adaptable motor have already been configured inside the controller. However, it is still necessary to perform motor auto-tuning or to modify the default values based on actual conditions. Otherwise, the running result and protection performance will be adversely affected.

The controller might cause an alarm or might be damaged when a short circuit exists on cables or inside the motor. Therefore, perform insulation short circuit test when the motor and cables are newly installed or during routine maintenance. During the test, disconnect the controller from the tested parts.

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Product Information

Chapter 2 Product Information

§ Safety Information

DANGER

■ To prevent injury

- Do not move the controller by catching the front cover or terminal cover.
  If you catch only the front cover or terminal cover, the main body may fall and injure you.
- Follow the ESD procedures during operating.
  Otherwise, the circuit inside the controller may be damaged by the static electricity.

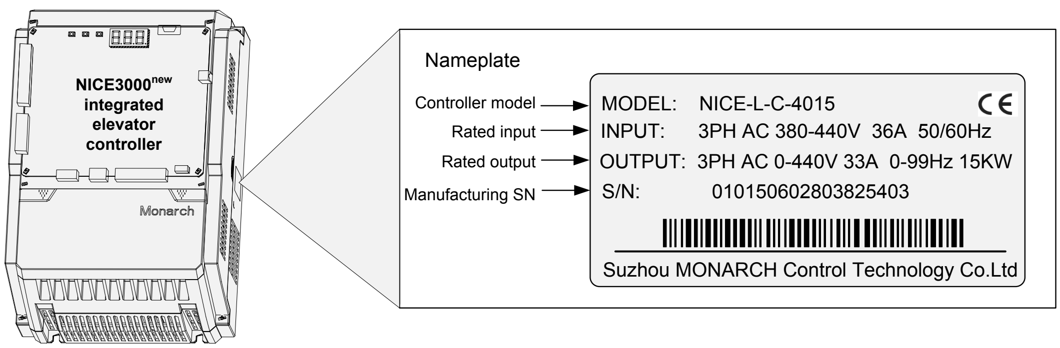
2.1 Acceptance

After receiving the product, unpack the packing box and check:

- Whether the nameplate model and controller ratings are consistent with your order. The box contains the controller, certificate of conformity, user manual and warranty card.
- Whether the controller is damaged during transportation. If you find any omission or damage, contact your supplier or us immediately.

2.2 Designation Rule and Nameplate

Figure 2-1 Designation rule and nameplate of the NICE3000new



Controller model

NICE - L - C - 40 15

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

Mark	Power Class
02	2.2 kW
03	3.7 kW
...	...
30	30 kW
45	45 kW

2

2.3 Exploded Views of Components

Figure 2-2 Exploded view of the plastic structure (2.2–15 kW)

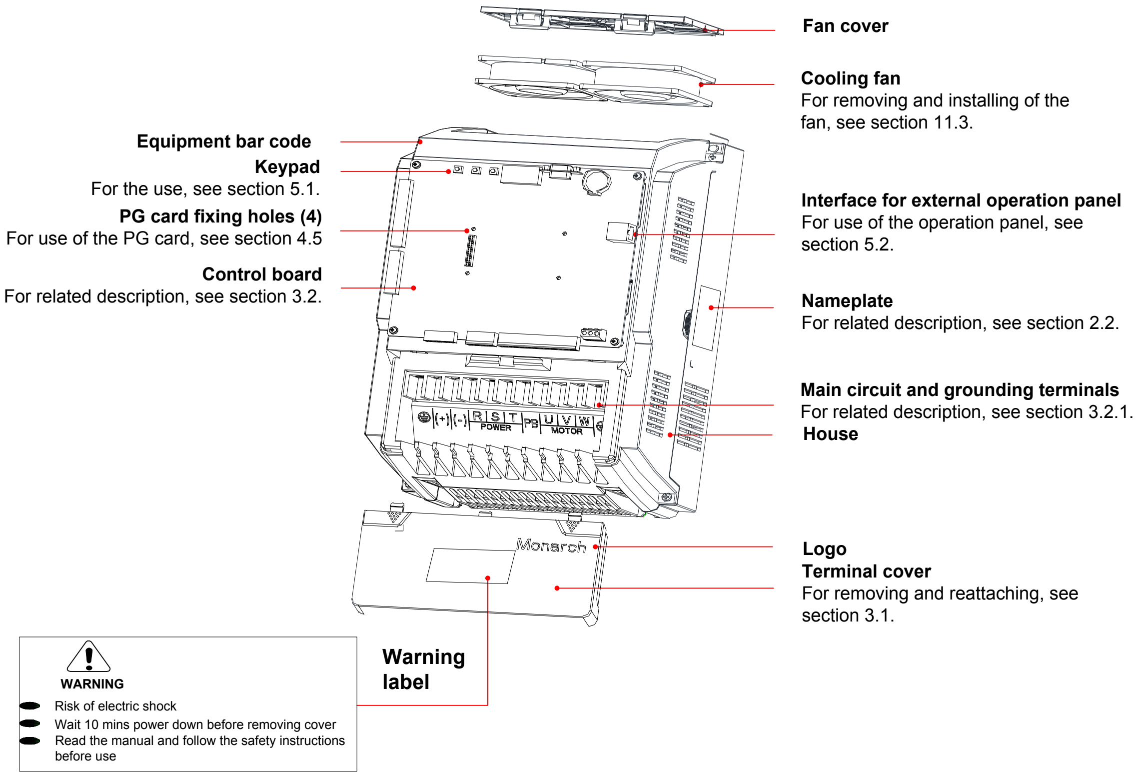
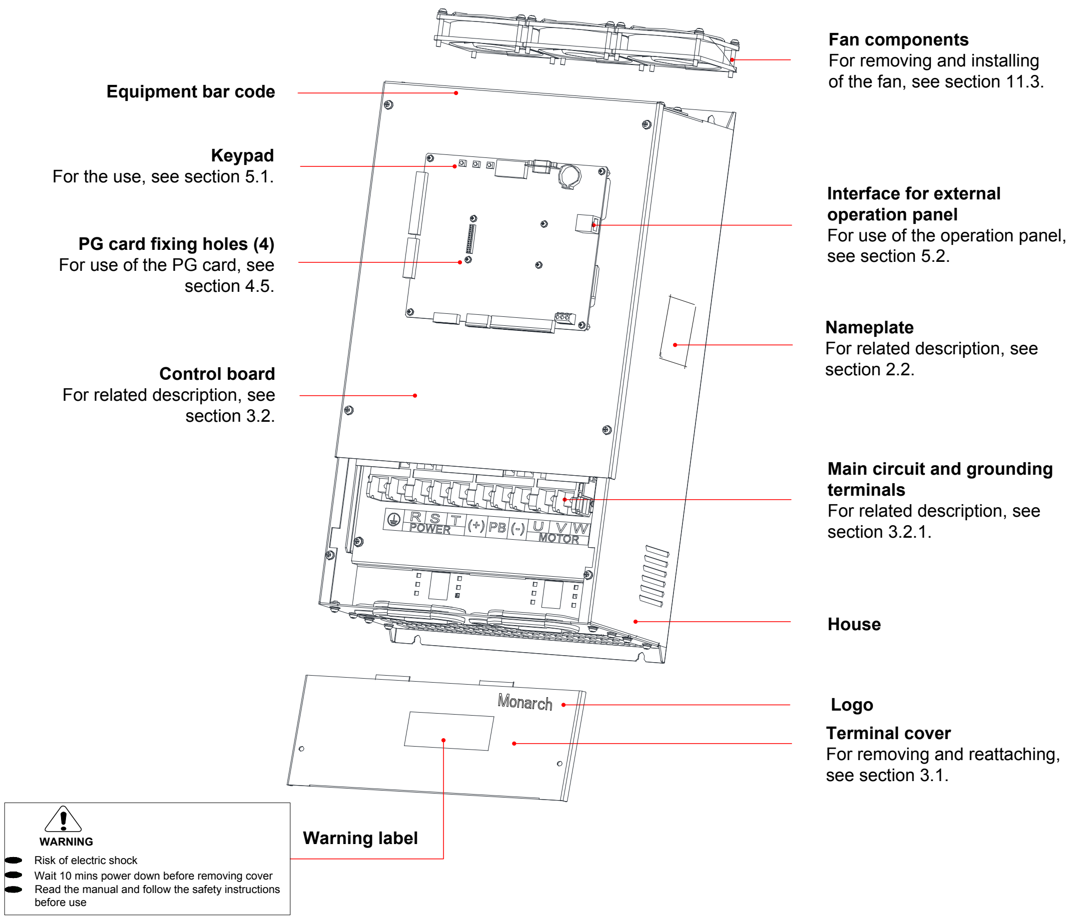
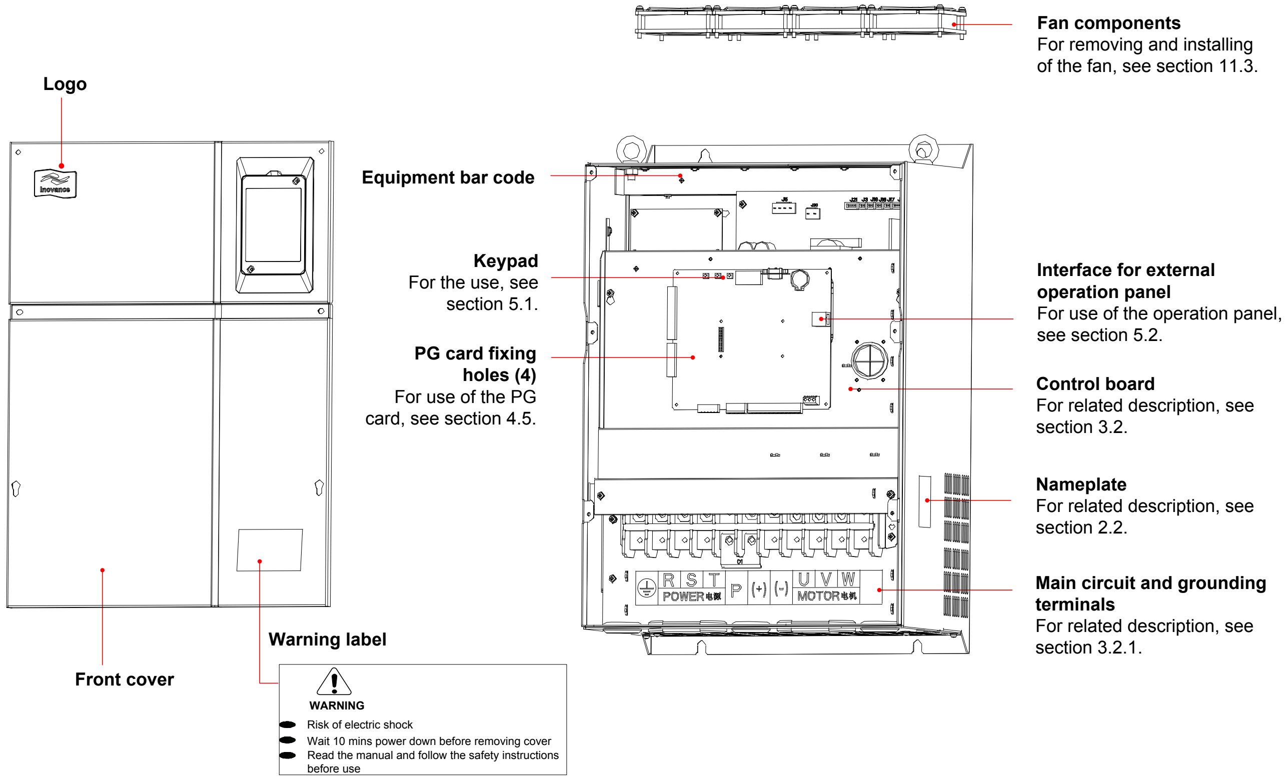


Figure 2-3 Exploded view of the sheet metal structure (18.5–30 kW)



2

Figure 2-4 Exploded view of the sheet metal structure (37–55 kW)



NOTE

The preceding figures show the exploded views of only common models 2.2 to 55 kW. For the structure of higher power ratings, contact us.

2.4 Models

Table 2-1 NICE3000new models

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Motor Power (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-4022	10.6	42.6	27.7	11
220-NICE-L-C-4030	13.1	52.6	34.6	15
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

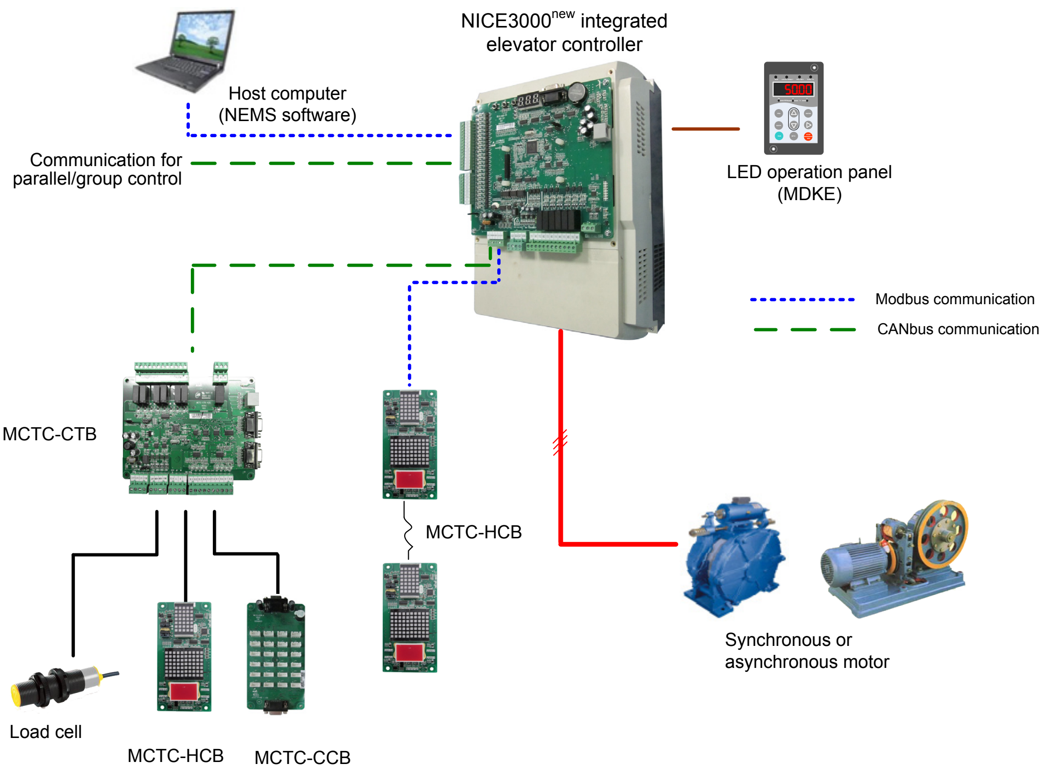
Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Motor Power (kW)
220-NICE-L-C-4018	15.0	41.0	39.0	11.0
220-NICE-L-C-4022	18.3	49.0	48.0	15.0
220-NICE-L-C-4030	23.0	62.0	60.0	18.5
Three-phase 380 V, range: 380–440 V, 50/60 Hz				
NICE-L-C-4002	4.0	6.5	5.1	2.2
NICE-L-C-4003	5.9	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-4018	24.0	41.0	39.0	18.5
NICE-L-C-4022	30.0	49.5	48.0	22.0
NICE-L-C-4030	40.0	62.0	60.0	30.0
NICE-L-C-4037	57.0	77.0	75.0	37.0
NICE-L-C-4045	69.0	93.0	91.0	45.0
NICE-L-C-4055	85.0	113.0	112.0	55.0
NICE-L-C-4075	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

2.5 System Configuration

The NICE3000new 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 2-5 System components of the NICE3000new

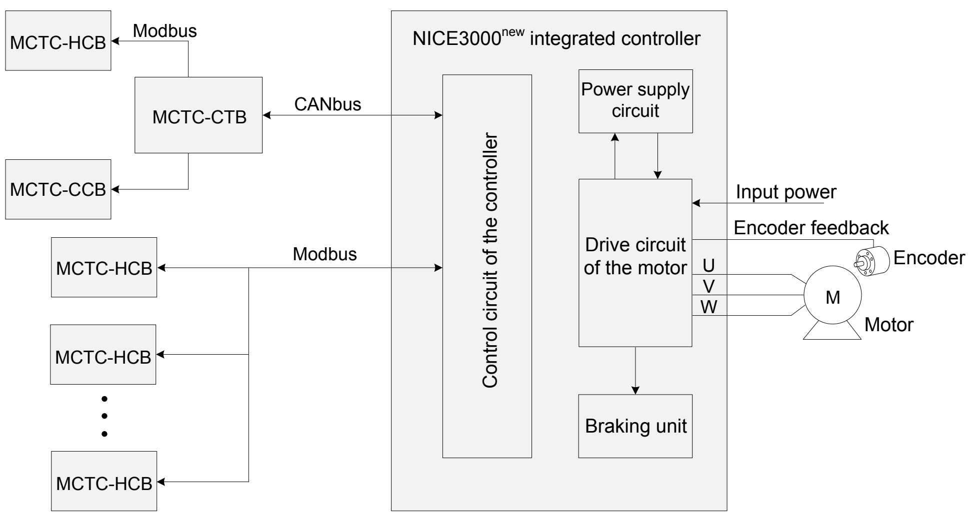


The NICE3000new has the following functions in the system:

- It 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.
- It implements information collection and control of car-related components by means of CANbus communication with the MCTC-CTB.
- It 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 NICE3000new.

Figure 2-6 System structure of the NICE3000new



3

Mechanical and Electrical Installation

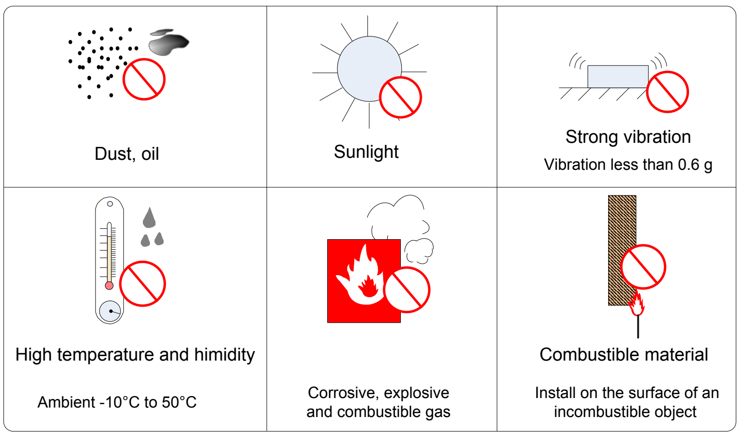
Chapter 3 Mechanical and Electrical Installation

3.1 Mechanical Installation

3.1.1 Planning Installation

1. Mounting environment requirements

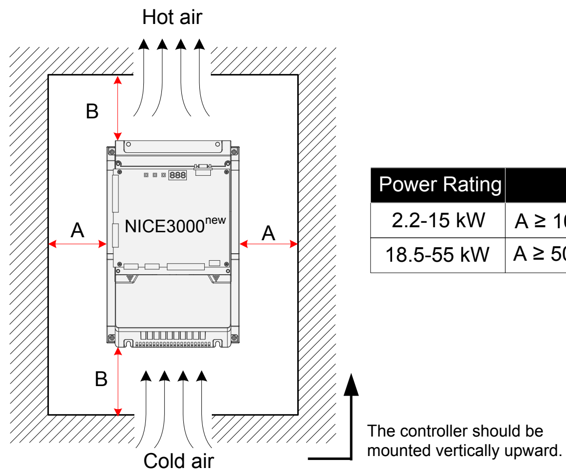
Item	Requirements
Ambient temperature	-10°C to 50°C
Heat dissipation	Install the controller on the surface of an incombustible object, and ensure that there is sufficient space around for heat dissipation. Install the controller vertically on the support using screws.
Mounting location	Free from direct sunlight, high humidity and condensation
	Free from corrosive, explosive and combustible gas
	Free from oil dirt, dust and metal powder
Vibration	Less than 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.



2. Mounting clearance requirements

The clearance that needs to be reserved varies with the power rating of the NICE3000^{new}, as shown in the following figure.

Figure 3-1 Clearance around the NICE3000new for mounting



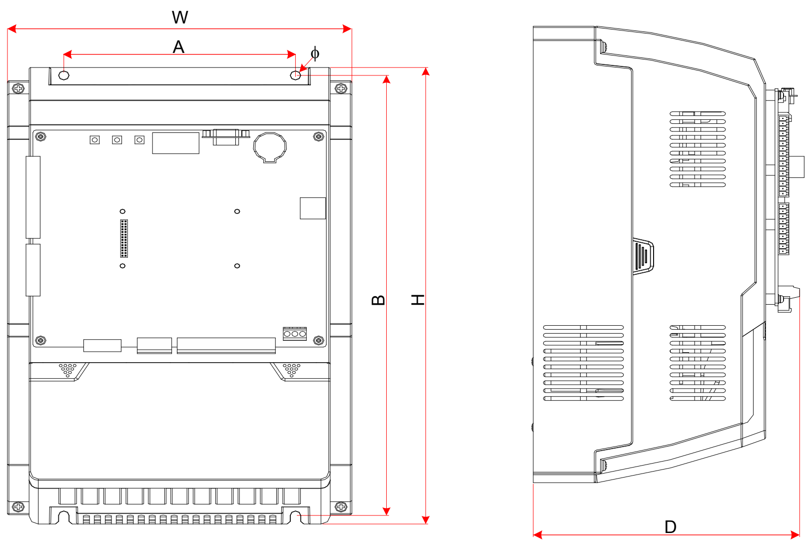
Power Rating	Clearance	
2.2-15 kW	A ≥ 10 mm	B ≥ 100 mm
18.5-55 kW	A ≥ 50 mm	B ≥ 100 mm

3. Mounting dimensions requirements

The following figures show the mounting dimension diagrams of the NICE3000new of different structures and sizes.

Figure 3-2 Mounting dimension diagrams of NICE3000new

1) Plastic structure, 2.2–15 kW, Size-C and Size-D



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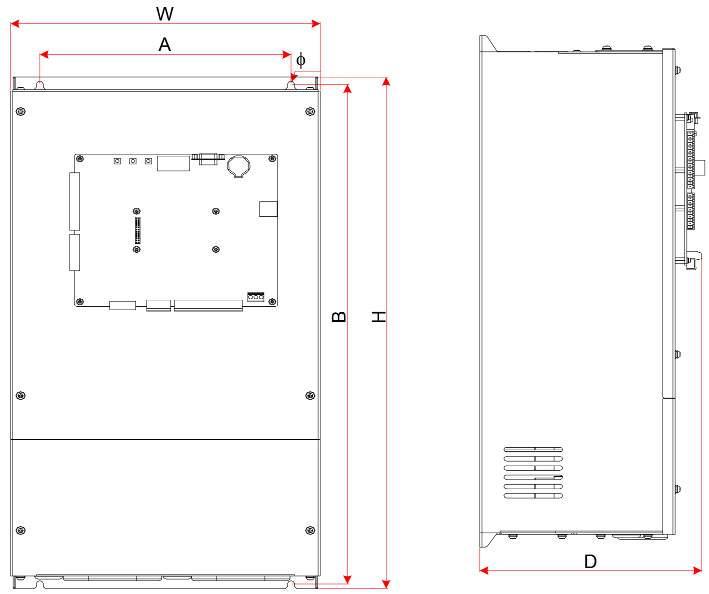
2) Sheet metal structure, 18.5–30 kW, Size-E



3) Sheet metal structure, 37–55 kW, Size-F

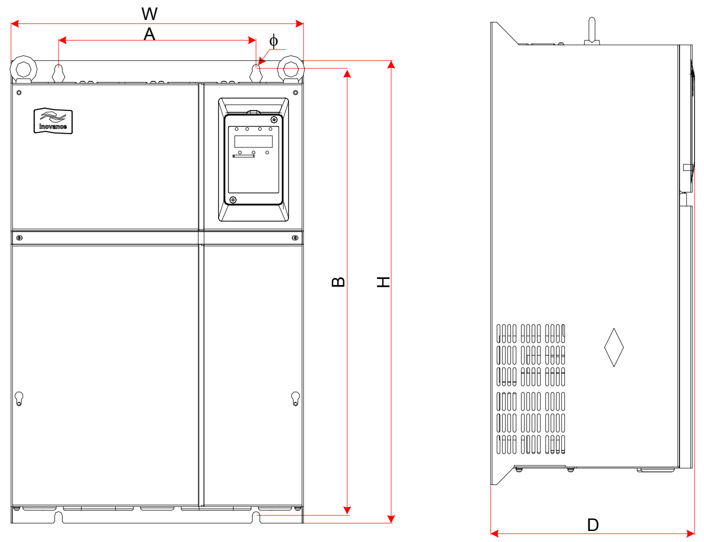


Table 3-1 Mounting dimensions of the NICE3000new

Controller Model	Physical Dimensions			Mounting Hole		Hole Diameter (mm)	Gross Weight (kg)	Size
	H (mm)	W (mm)	D (mm)	A (mm)	B (mm)	Φ (mm)		
Single/Three-phase 220 V, range: 200−240 V								
NICE-L-C-2002	347	223	143	150	334.5	6.5	5.5	SIZE-C
NICE-L-C-2003								
220-NICE-L-C-4007	347	223	172.5	150	334.5	6.5	7	SIZE-D
220-NICE-L-C-4011								
220-NICE-L-C-4015								
220-NICE-L-C-4018	554.5	289.6	207.7	235	541.5	6.5	14.5	SIZE-E
220-NICE-L-C-4022								
220-NICE-L-C-4030								

Controller Model	Physical Dimensions			Mounting Hole		Hole Diameter (mm)	Gross Weight (kg)	Size
	H (mm)	W (mm)	D (mm)	A (mm)	B (mm)	Φ (mm)		
Three-phase 380 V, range: 380−440 V								
NICE-L-C-4002								
NICE-L-C-4003	347	223	143	150	334.5	6.5	5.5	SIZE-C
NICE-L-C-4005								
NICE-L -C-4007								
NICE-L -C-4011	347	223	173.5	150	334.5	6.5	7	SIZE-D
NICE-L -C-4015								
NICE-L-C-4018								
NICE-L-C-4022	554.5	289.6	223	235	541.5	6.5	14.5	SIZE-E
NICE-L-C-4030								
NICE-L-C-4037								
NICE-L-C-4045	600	385	268.42	260	580	10	32	SIZE-F
NICE-L-C-4055								
NICE-L-C-4075	700	473	307	343	678	10	47	SIZE-G
NICE-L-C-4090								
NICE-L-C-4110								
NICE-L-C-4132	930	579	380	449	903	10	90	SIZE-H
NICE-L-C-4160								

4. Mounting orientation requirements

Figure 3-3 Mounting orientation of the NICE3000new

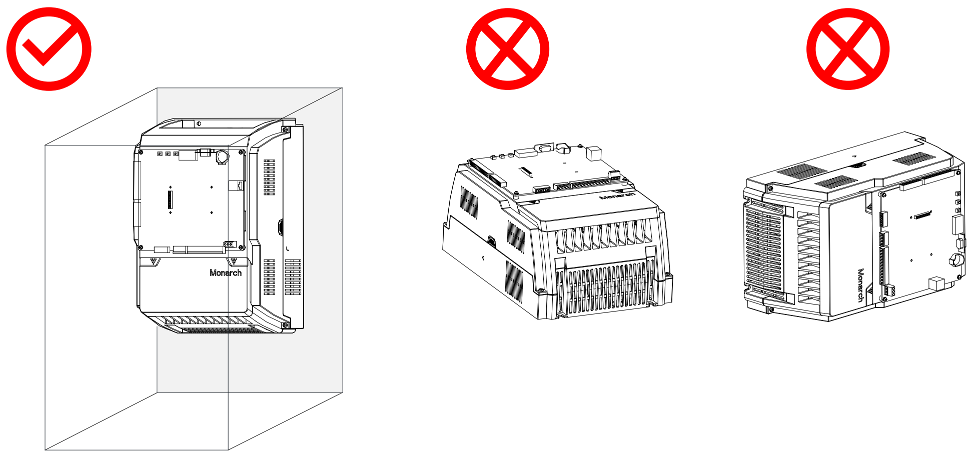
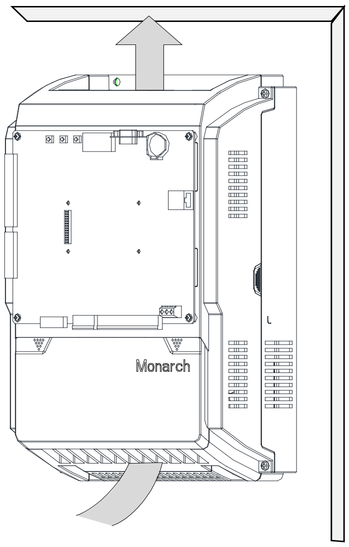


Figure 3-4 Heat dissipation direction

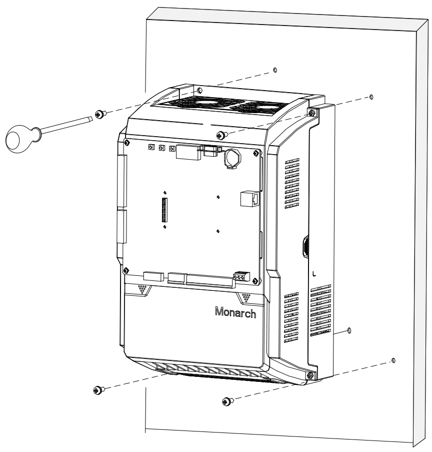


3.1.2 Mounting Procedure

The NICE3000new is generally mounted into the control cabinet inside the equipment room by using the wall-mounting method. It is fastened onto the support with four screws fixed into the four mounting holes, as shown in the following figure.

The plastic structure and sheet metal structure have the same mounting method.

Figure 3-5 Wall-mounting diagram



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:

- The temperature inside the cabinet must not rise to 10°C higher than the temperature outside the cabinet.
- A closed control cabinet must be configured with a fan (or other air cooling device such as air conditioner) to ensure air circulation.
- 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.

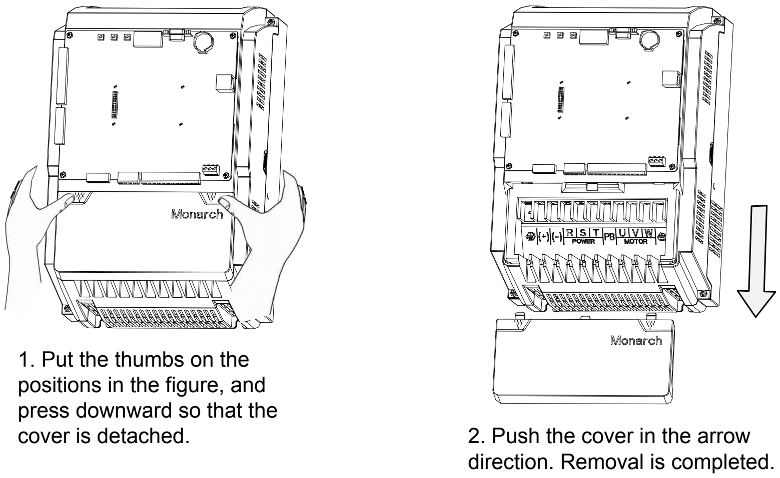
- A vent must be available at bottom of the control cabinet to form bottom-up air flow, which prevents heat island effect on the surface of components or partial thermal conductivity effect.
- If the fan does not meet the cooling requirements, install an air conditioner in the cabinet or in the equipment room. Note that the temperature inside the cabinet must not be too low; otherwise, condensation may occur, causing short circuit of components.
- For special environment where the temperature is high but cannot be reduced effectively, de-rate the controller during use.

3.1.3 Removing and Reattaching Terminal Cover

1. Removing and reattaching the terminal cover with plastic structure

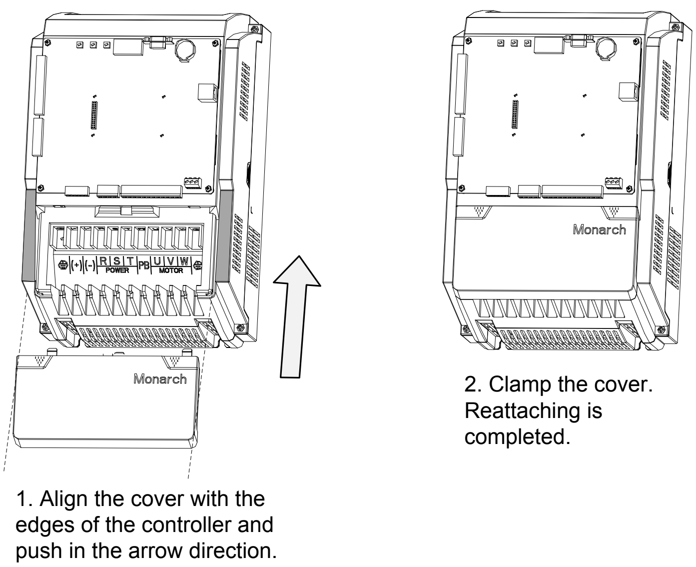
Before wiring the main circuit terminals, you need to remove the terminal cover.

Figure 3-6 Removing the terminal cover with plastic structure



After wiring to the main circuit terminals is completed, reattach the terminal cover.

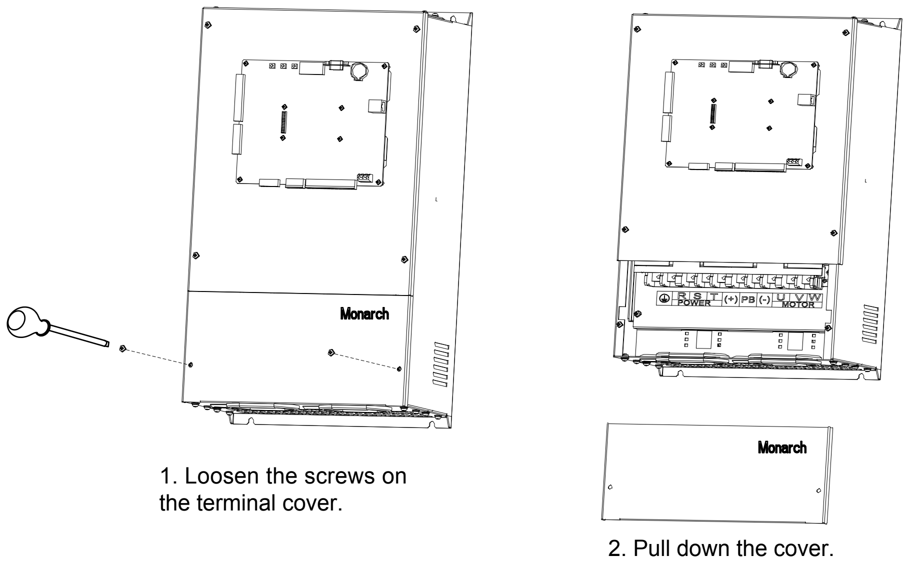
Figure 3-7 Reattaching the terminal cover with plastic structure



2. Removing and reattaching the terminal cover with sheet metal structure

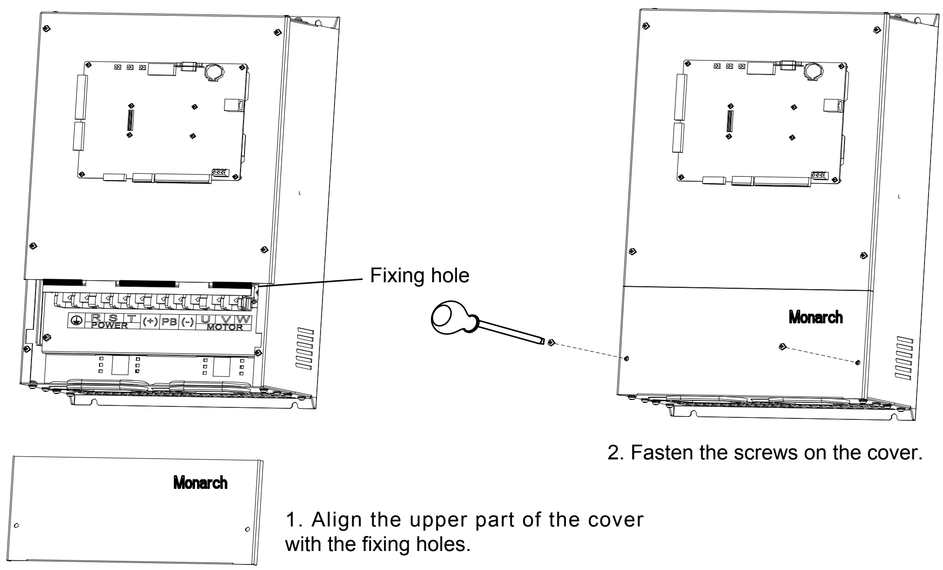
Before wiring the main circuit terminals, you need to remove the terminal cover.

Figure 3-8 Removing the terminal cover with sheet metal structure



After wiring to the main circuit terminals is completed, reattach the terminal cover.

Figure 3-9 Reattaching the terminal cover with sheet metal structure

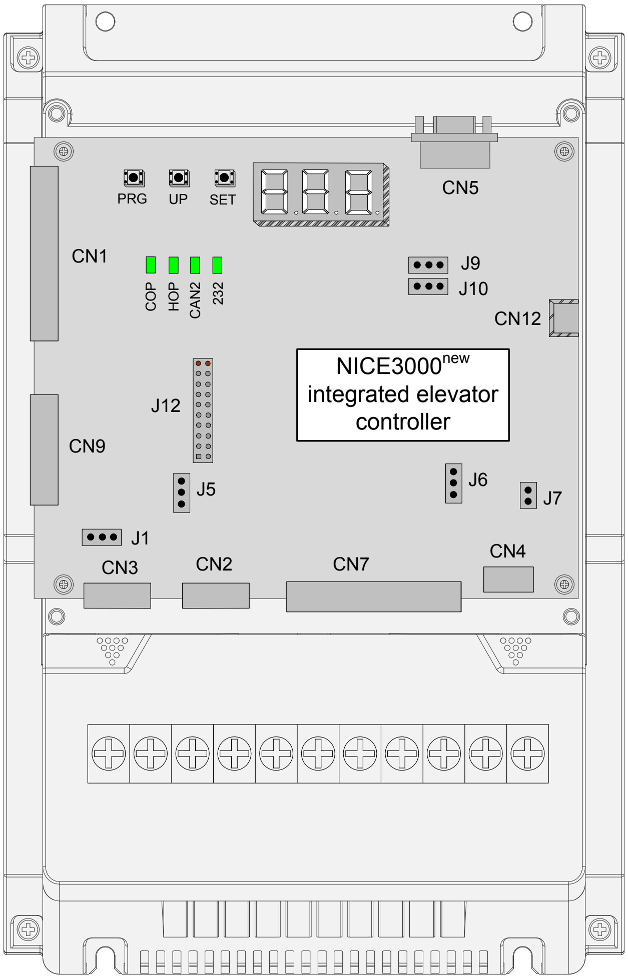


3

3.2 Electrical Wiring

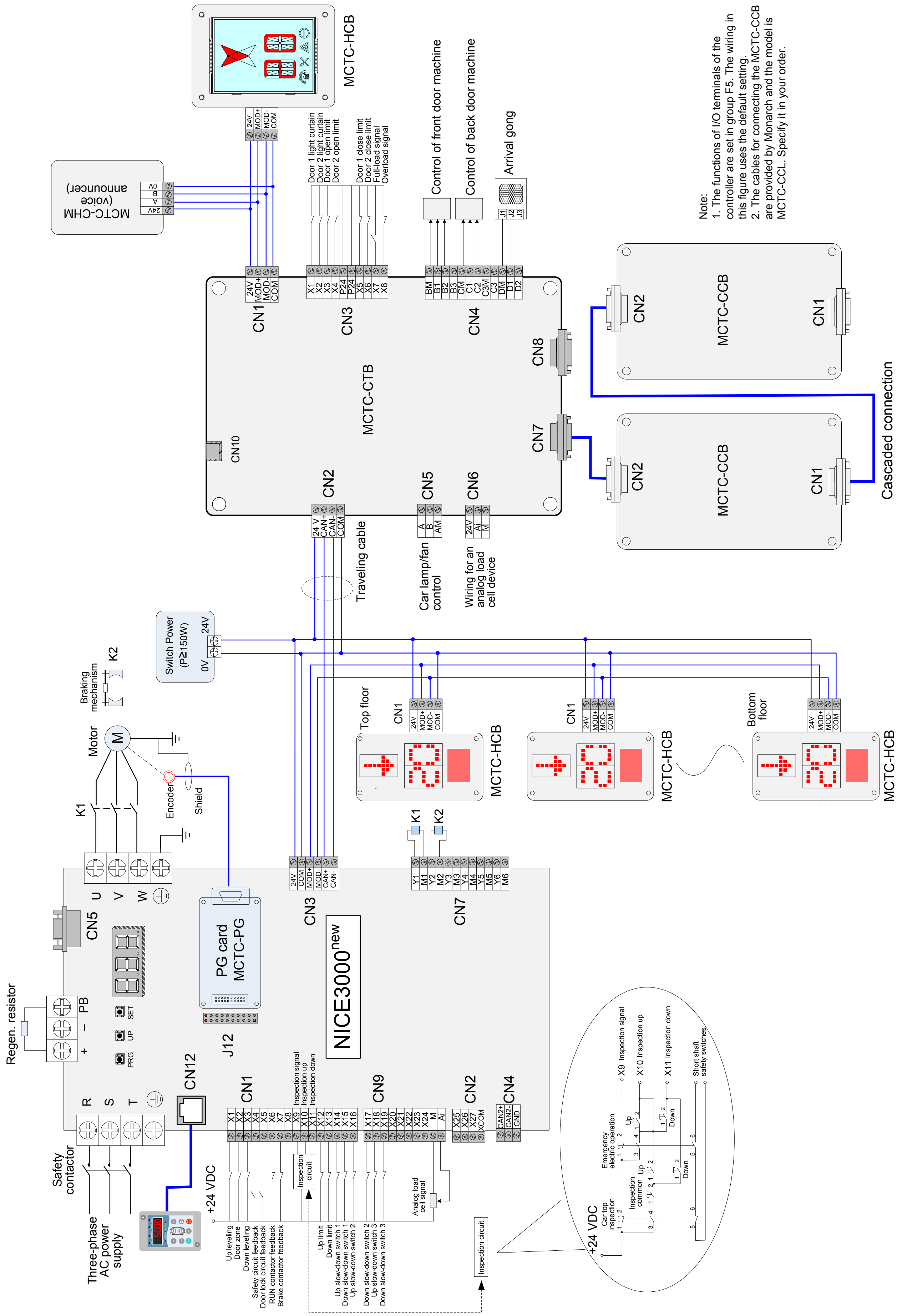
The following figure shows overall terminal arrangement of the NICE3000^{new}.

Figure 3-10 Overall terminal arrangement of the NICE3000^{new}



3.2.1 Standard System Wiring Diagram

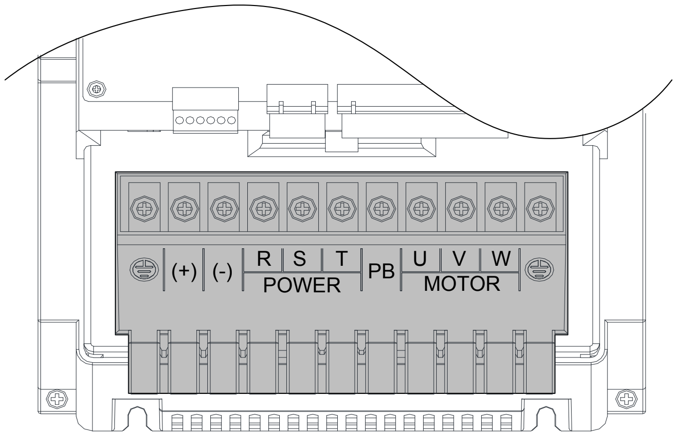
Figure 3-11 Standard wiring diagram of the NICE3000^{new} control system


MCTC-HCB
MCTC-CHM (voice announcer)
24V B A 0V
24V MOD+ MOD- COM
Door 1 light curtain
Door 2 light curtain
Door 1 open limit
Door 2 open limit
Door 1 close limit
Door 2 close limit
Full-load signal
Overload signal
Control of front door machine
Control of back door machine
Arrival gong
CN1
CN3
CN4
MCTC-CTB
CN10
CN8
CN7
CN2
CN5
CN6
MCTC-CCB
Cascaded connection
Note:
1. The functions of I/O terminals of the controller are set in group F5. The wiring in this figure uses the default setting.
2. The cables for connecting the MCTC-CCB are provided by Monarch and the model is MCTC-CCL. Specify it in your order.
Traveling cable
Car lamp/fan control
Wiring for an analog load cell device
Switch Power (P≥150W)
24V
0V
Braking mechanism
K2
Motor
K1
Encoder
Shield
Top floor
Bottom floor
Regen. resistor
PB
U V W
R S T
PG card MCTC-PG
J12
NICE3000new
CN12
Safety contactor
Three-phase AC power supply
+24 VDC
Up leveling
Door zone
Down leveling
Safety circuit feedback
Door lock circuit feedback
RUN contactor feedback
Brake contactor feedback
Inspection signal
Inspection up
Inspection down
Inspection circuit
Up limit
Down limit
Up slow-down switch 1
Down slow-down switch 1
Up slow-down switch 2
Down slow-down switch 2
Up slow-down switch 3
Down slow-down switch 3
Analog load cell signal
CN9
Emergency electric operation
Car top inspection
Inspection common
Up
Down
X9 Inspection signal
X10 Inspection up
X11 Inspection down
Short shaft safety switches

3.2.2 Description and Wiring of Main Circuit Terminals

◆ Main Circuit Terminal Arrangement Example

Figure 3-12 Main circuit terminal arrangement example



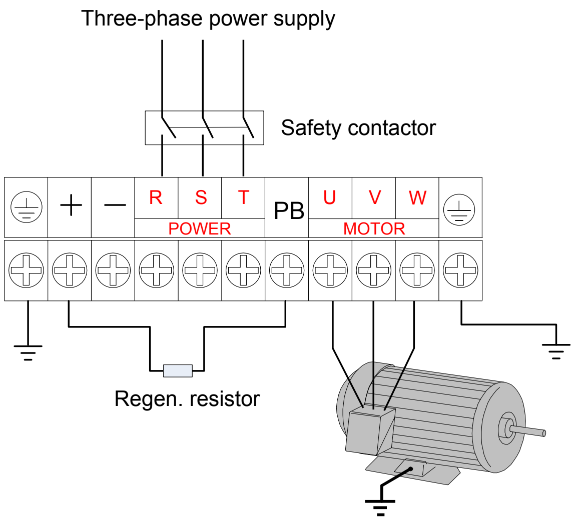
◆ Main Circuit Terminal Descriptions

Table 3-2 Main circuit terminal descriptions

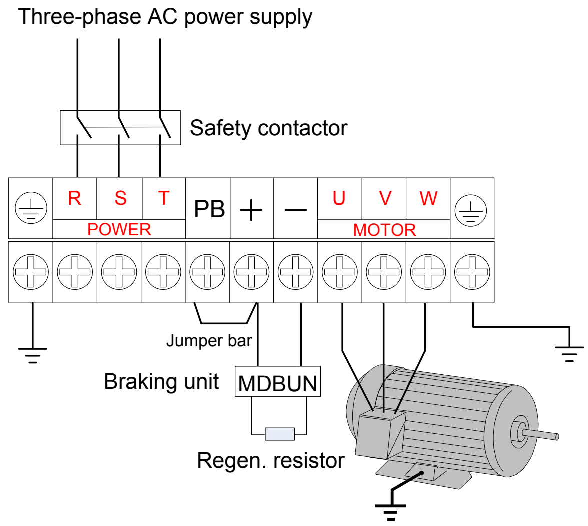
Terminal	Name	Function Description
R, S, T	Three-phase power input terminals	Provide three-phase power supply.
(+), (-)	Positive and negative terminals of DC bus	Connect the external braking unit and energy feedback unit for models of 37 kW and above.
(+), PB (P)	Terminals for connecting regen. resistor	Connect the regen. resistor for models of below 37 kW. Connect the DC reactor for models of 37 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	Connect the three-phase motor.
⏚	Grounding terminal	Must be grounded.

◆ Main Circuit Wiring

Figure 3-13 Main circuit connection diagram



(For models of below 37 kW)

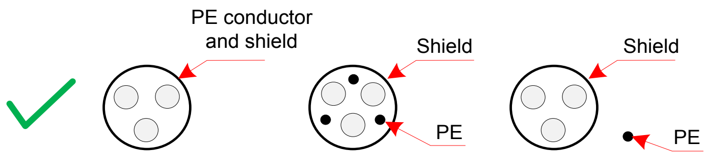


(For models of 37 kW and above)

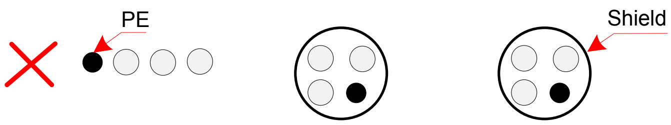
1) Cable selection for main circuit

The symmetric shielded cable is recommended as the input and output power cables of the main circuit. The symmetric shielded cable can reduce electromagnetic radiation of the entire conducting system compared with the 4-core cable.

Symmetric shielded cable (recommended power cable)



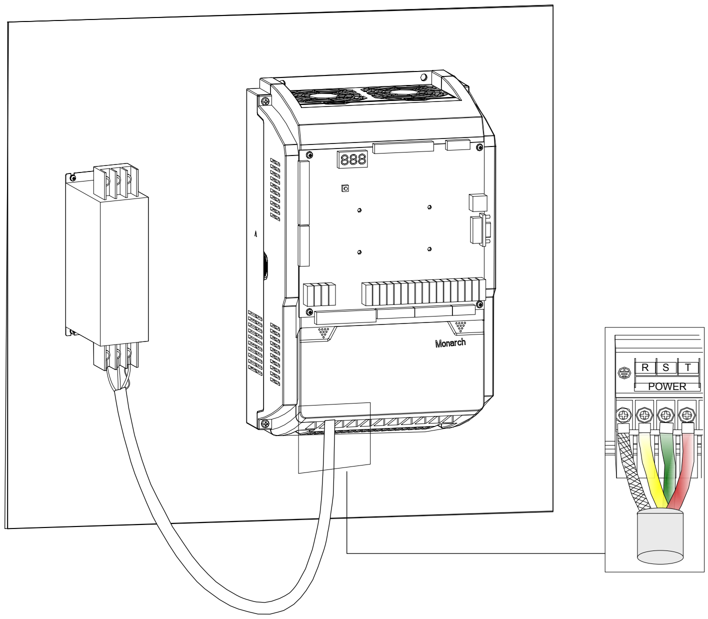
Non-recommended power cable



2) 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 4-2.
- 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 3-14 Installing filter and controller on the conductive plane



3) 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 VAC 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.

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

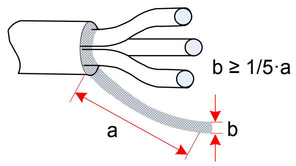
- These terminals are valid only for the models below 37 kW that have the built-in braking unit.
- Connect a regen. resistor of the recommended model, and ensure that the cable length of the regen. resistor is shorter than 5 m. Otherwise, it may damage the controller.

5) 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 4-2.
- Do not connect a capacitor or surge absorber to the output side of the controller. Otherwise, it may cause frequent controller trips or even damage the controller.
- 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 smaller than 1/5 of the length.



6) 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 3-3 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
35 mm^2 < S	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.

6) Upstream protection device

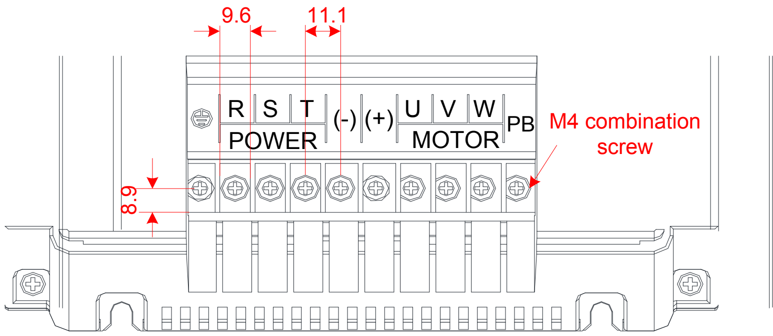
- Install a proper protection device on the power input side to provide protections on overcurrent, short circuit and electrical isolation.
- When selecting the protection device, consider the current capacity of the power cable, system overload capacity and short circuit capacity of upstream power distribution. Generally, make selection according to the recommended values in Table 4-1.

3

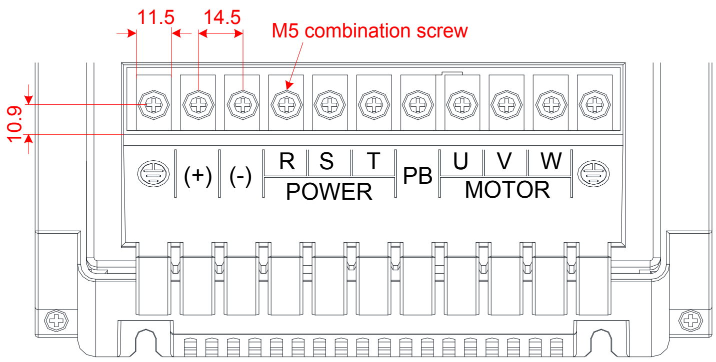
3.2.3 Main Circuit Cable Sizes and Tightening Torque

Figure 3-15 Main circuit cable size diagrams (Size C to Size E)

1) Plastic structure, Size C



2) Plastic structure, Size D



3) Sheet metal structure, Size E

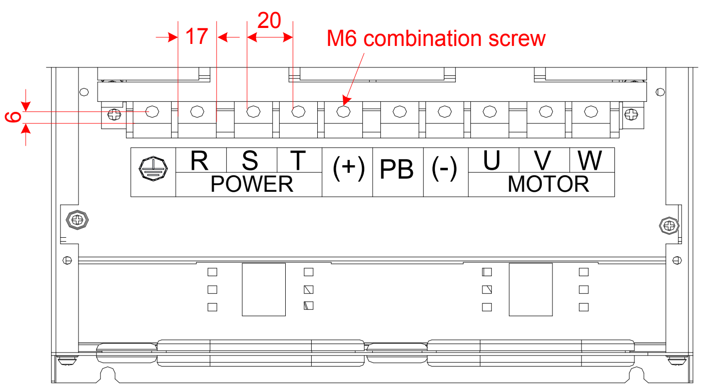


Table 3-4 Cable size and torque of Size C to Size E (NICE-L-C-4002/3/5/7/11/15/22/30)

Controller Model	Rated Input Current (A)	Recommended Output Power Cable Diameter (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4002	6.5	0.75	1.2	TNR0.75-4
NICE-L-C-4003	10.5	1.5	1.2	TNR1.25-4
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	41.0	10	4.0	GTNR10-6

3

Controller Model	Rated Input Current (A)	Recommended Output Power Cable Diameter (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4022	49.5	10	4.0	GTNR16-6
NICE-L-C-4030	62.0	16	4.0	GTNR16-6

Figure 3-16 Main circuit cable size diagram of sheet metal structure, Size F

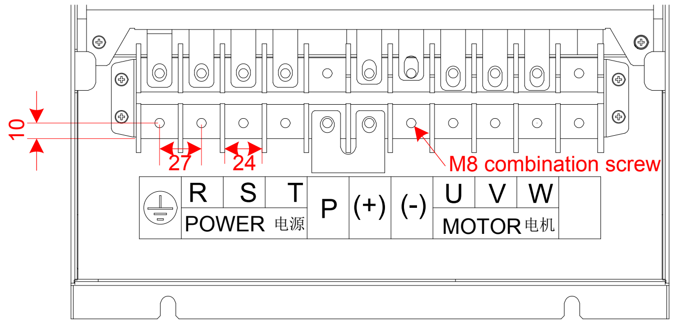


Table 3-5 Cable size and torque of Size F (NICE-L-C-4037/45/55)

Controller Model	Rated Input Current (A)	Recommended Output Power Cable Diameter (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4037	77.0	25	10.5	GTNR25-8
NICE-L-C-4045	93.0	35	10.5	GTNR35-8
NICE-L-C-4055	113.0	50	10.5	GTNR50-8

Figure 3-17 Main circuit cable size diagram of sheet metal structure, Size G

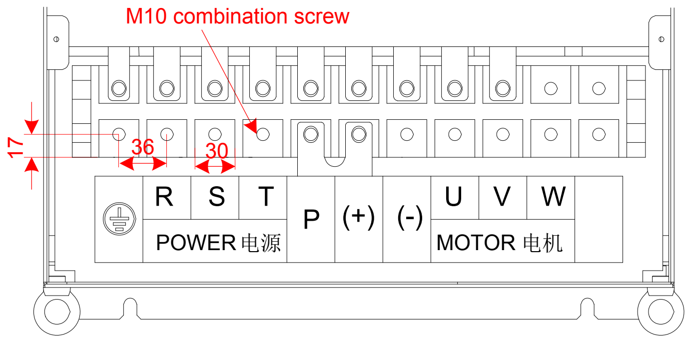


Table 3-6 Cable size and torque of Size G (NICE-L-C-4075/95)

Controller Model	Rated Input Current (A)	Recommended Output Power Cable Diameter (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	180.0	95	20	GTNR95-10

Figure 3-18 Main circuit cable size diagram of sheet metal structure, Size H

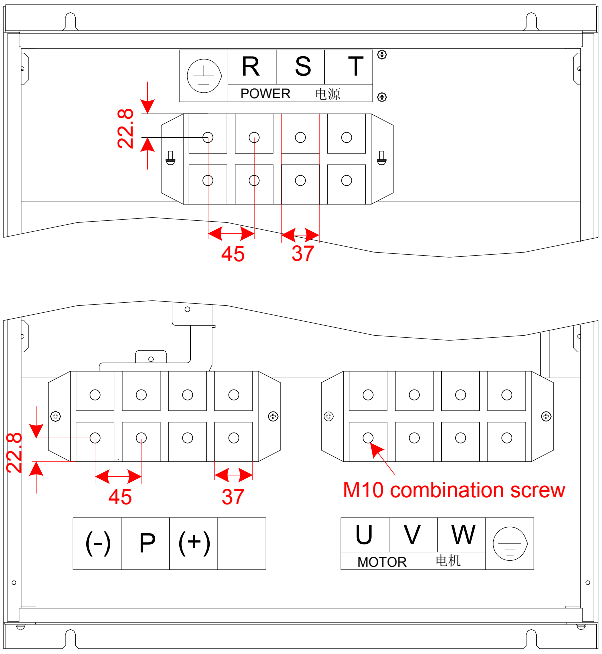


Table 3-7 Cable size and torque of Size H (NICE-L-C-4110/132/160)

Controller Model	Rated Input Current (A)	Recommended Output Power Cable Diameter (mm^2)	Torque of Torque Driver (N·m)	Recommended Cable Lug Model
NICE-L-C-4110	214.0	120	35.0	GTNR120-12
NICE-L-C-4132	256.0	120	35.0	GTNR120-12
NICE-L-C-4160	307.0	150	35.0	GTNR150-12

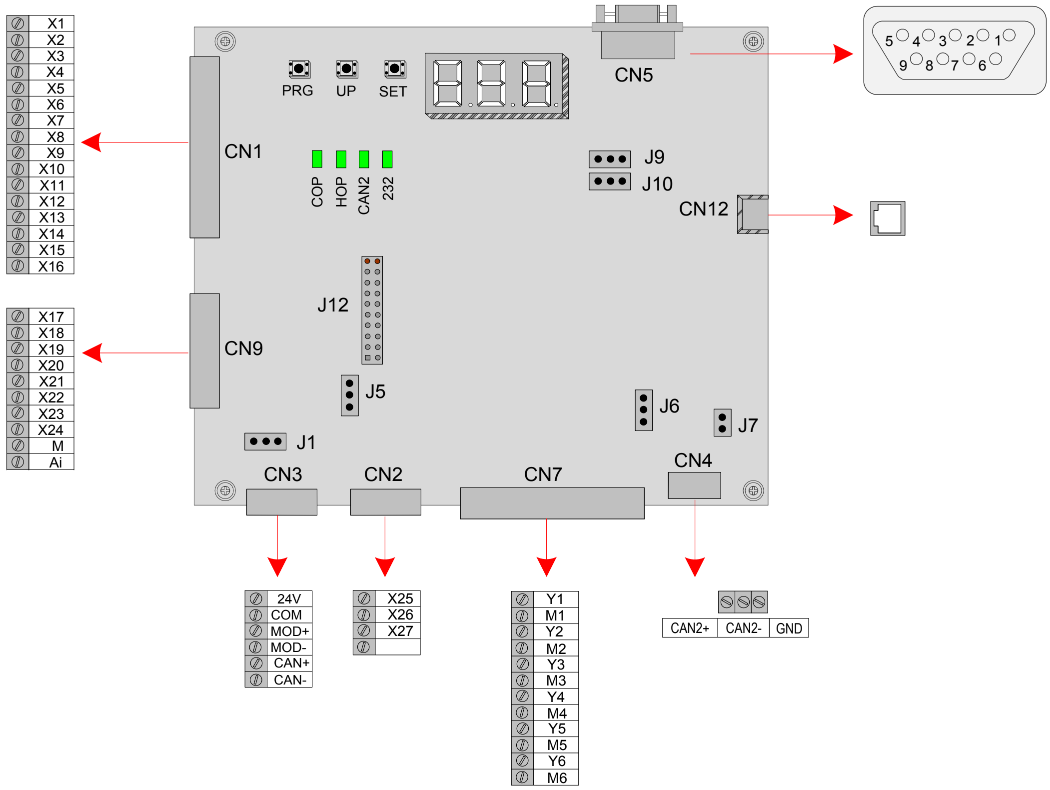
The manufacturuer of the above recommended cable lug models is Suzhou Yuanli Metal Enterprise. For details, see the related documentation of Yuanli.

3

3.2.4 Description and Wiring of Control Circuit Terminals

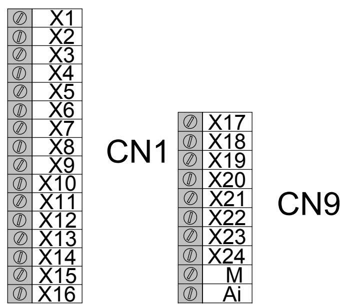
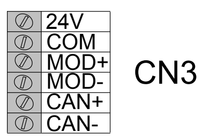
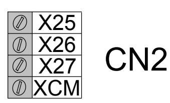
◆ Control Circuit Terminal Arrangement

Figure 3-19 Control circuit terminal arrangement



◆ Control Circuit Terminal Description

Table 3-8 Control circuit terminal description

Mark	Code	Terminal Name	Function Description	Terminal Arrangement
CN1	X1 to X16	DI	Input voltage range: 10–30 VDC Input impedance: 3.5 kΩ Optocoupler isolation Input current limit: 5 mA Functions set in F5-01 to F5-24	
CN9	X17 to X24	DI		
	Ai/M	AI	Used for the analog load cell device	
CN3	24V/ COM	External 24 VDC power supply	24 VDC power supply for the entire board	
	MOD+/-	RS485 differential signal	Standard isolated RS485 communication interface, used for hall call and display	
	CAN+/-	CANbus differential signal	CANbus communication interface, communication with the CTB	
CN2	X25 to X27/ XCM	Higher-voltage detection terminal	Input voltage range: 110 VAC±15% Safety circuit and door lock circuit, function set in F5-37 to F5-39	

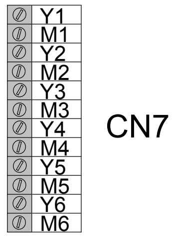
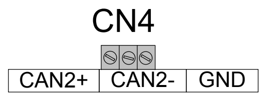
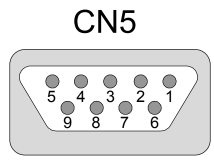
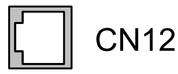
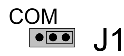
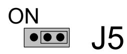
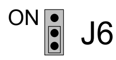
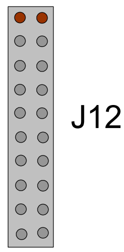
Mark	Code	Terminal Name	Function Description	Terminal Arrangement
CN7	Y1/M1 to Y6/M6	Relay output	NO, maximum current and voltage rating: 5 A, 250 VAC Function set in F5-26 to F5-31	
CN4	CAN2+/-	CAN2 differential signal	CAN2 communication interface, used for parallel/group control	
CN5	DB9 interface	RS232 communication interface	Interface for: Commission software community monitoring RS232/RS485 parallel/group control Software download of the MCB and drive board	
CN12	RJ45 interface	Operation panel interface	Used to connect the external operation panel	
J1	Optional grounding terminal for AI		The pins marked with “COM” are connected to the ground.	
J5	Termination resistor connection terminal for the CAN1 communication control board		The pins marked with “ON” are connected to the termination resistor.	
J6	Termination resistor connection terminal for the CAN2 communication control board		The pins marked with “ON” are connected to the termination resistor.	
J7	Grounding terminal of the control board.		If it is shorted, the ground of the control board is connected to the ground of the controller.	
J12	Interface for connecting the PG card		-	
J9/J10	Factory reserved		Do not short them randomly. Otherwise, the controller may not work properly.	-

Table 3-9 Description of indicators on the MCB

Mark	Terminal Name	Function Description
COP	CAN1 communication indicator	When communication between the MCB and the CTB is normal, this indicator is on (green).
HOP	Modbus 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 mode is normal.

3

Mark	Terminal Name	Function Description
232	Serial communication indicator	This indicator is on (green) when communication with the host computer or cell/remote monitoring board is normal.
X1 to X24	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.

◆ Control Circuit Wiring

- Cable selection for control circuit

  Use copper conductors of a proper size as control cables according to the recommended values in Table 4-2.

- Cabling requirement of control circuit

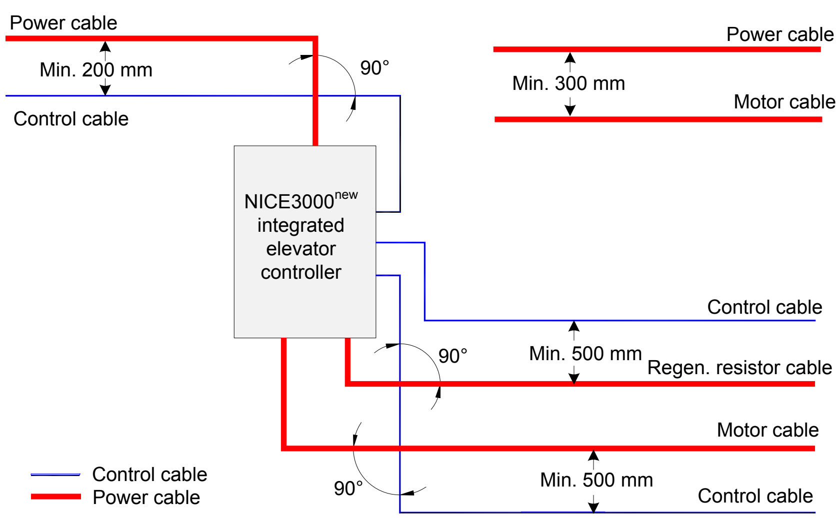
  The motor cables must be laid far away from all control cables.

  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 other 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°.

  The following figure shows the recommended cabling diagram.

  Figure 3-20 Cabling diagram



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3.2.5 Control Circuit Cable Sizes and Tightening Torque

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 3-21 Control circuit tubular terminal requirement

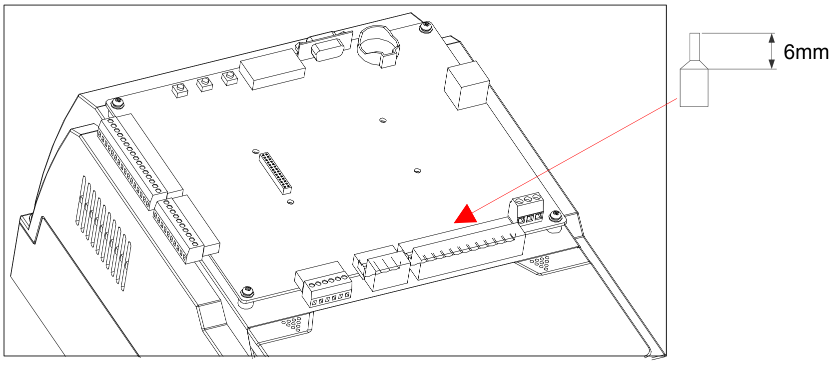


Table 3-10 Control cable specifications

	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

3

3.2.6 Wiring Checklist

□√	No.	Item
□	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 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.
□	14	Check correct wiring of the braking components and proper resistance of the regen. resistor.
□	16	The control circuit signal cables use the shielded twisted pair.
□	17	The optional boards are wired correctly.
□	18	The control circuit cables are separated from the main circuit cables during cabling.

3.3 Interface and Communication

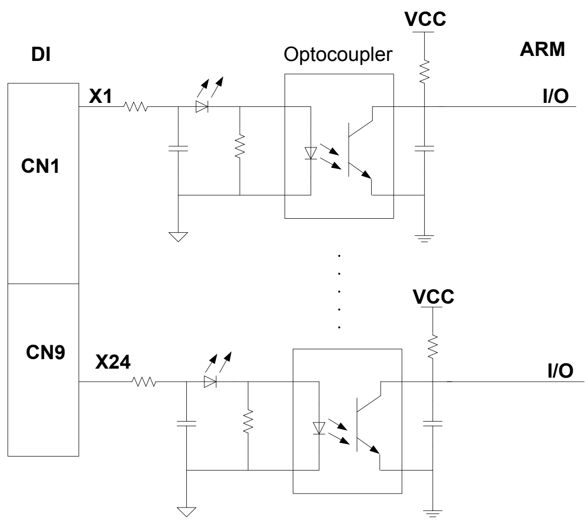
3.3.1 Digital Input (DI)

Quantity	24
Code	X1 to X24
Function code	F5-01 to F5-24
Input impedance	3.5 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.

3

Figure 3-22 DI circuit



The DI functions are set in F5-01 to F5-24.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
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 up signal NO/NC 10/42: Inspection down signal NO/NC (To be continued)	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	-	★

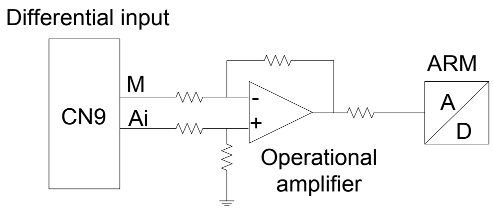
Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-08	X8 function selection	12/44: Up limit signal NO/NC 13/45: Down limit signal NO/NC 14/46: Overload signal NO/NC 15/47: Full-load signal NO/NC 16/48: Up slow-down 1 signal NO/NC 17/49: Down slow-down 1 signal NO/NC 18/50: Up slow-down 2 signal NO/NC 19/51: Down slow-down 2 signal NO/NC Others: 00: Invalid 11/43: Fire emergency signal NO/NC 20/52: Up slow-down 3 signal NO/NC 21/53: Down slow-down 3 signal 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 (End)	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	-	★

3.3.2 Analog Differential Input (AI)

Quantity	2
Code	Ai/M
Input voltage	-10 to 10 VDC
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 3-23 Analog differential input circuit



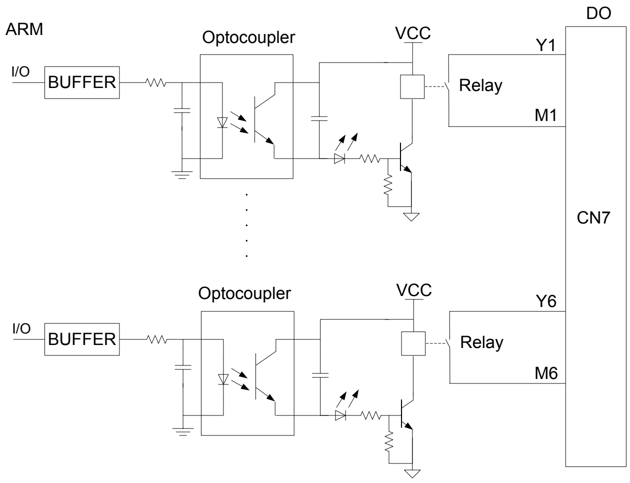
3.3.3 Relay Output (DO)

Quantity	6
Code	Y1/M1 to Y6/M6
Function code	F5-26 to F5-31
Relay characteristics	
Rated load	5 A, 250 VAC/30 VDC
Maximum current	5 A
Response time	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 varistor is used at the relay contact, and a absorption circuit such as varistor , RC absorption circuit, or diode is installed on the inductive load to reduce the interference to the minimum.

Figure 3-24 Relay output circuit



The DO functions are set in F5-26 to F5-31.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-26	Y1 function selection	01: RUN contactor control 02: Brake contactor control 03: Shorting door lock circuit contactor control 04: Fire emergency floor arrival signal feedback Others: 00: Invalid 05: Door machine 1 open 06: Door machine 1 close 07: Door machine 2 open 08: Door machine 2 close 09: Brake and RUN contactors healthy 10: Fault state 11: Running monitor 12: Shorting PMSM 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	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	-	★

3.3.4 Modbus Communication

◆ Hardware Connection and EMC Precautions

1. RS485 hardware connection

Figure 3-25 RS485 connection between the controller and the HCB

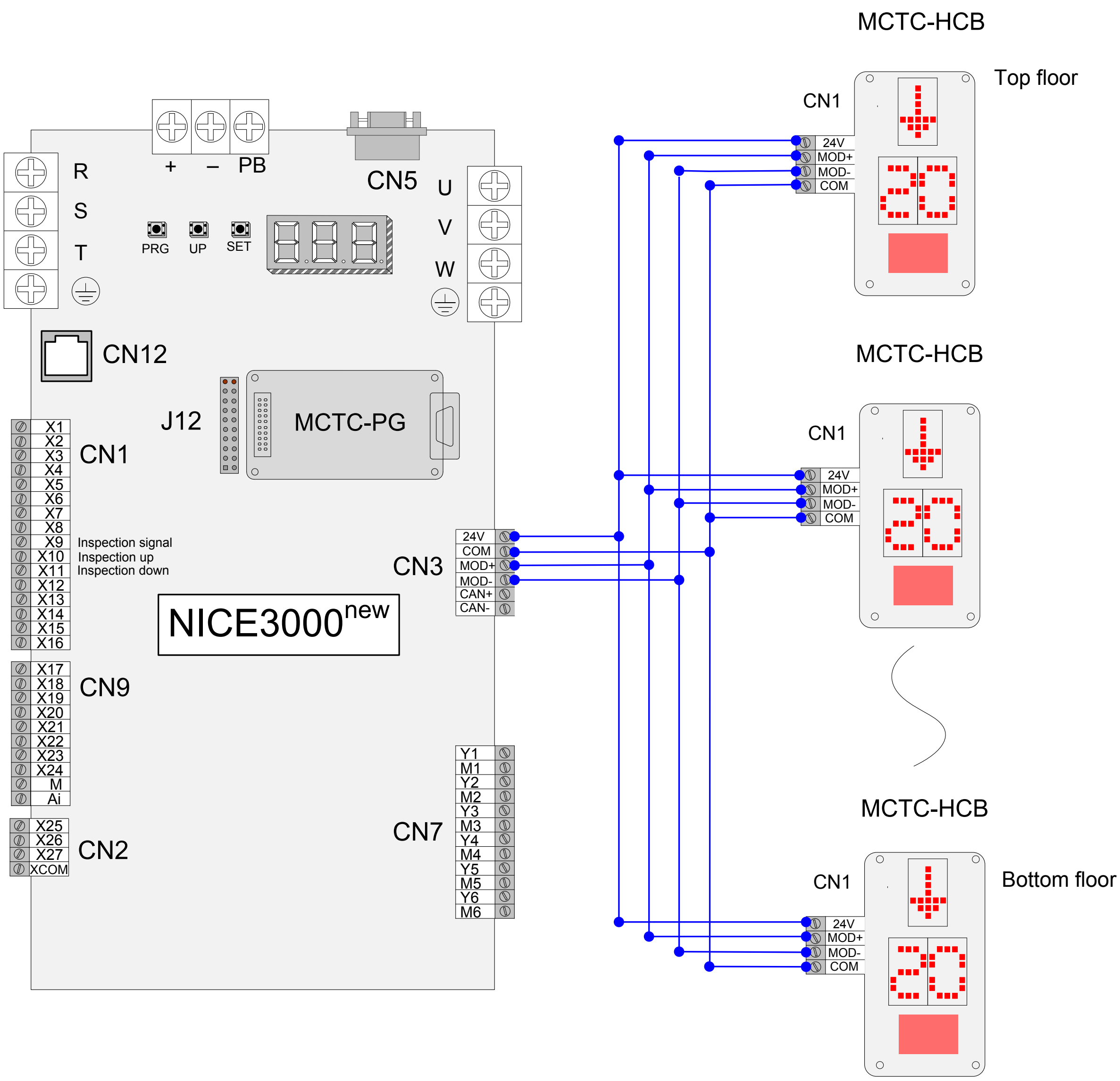
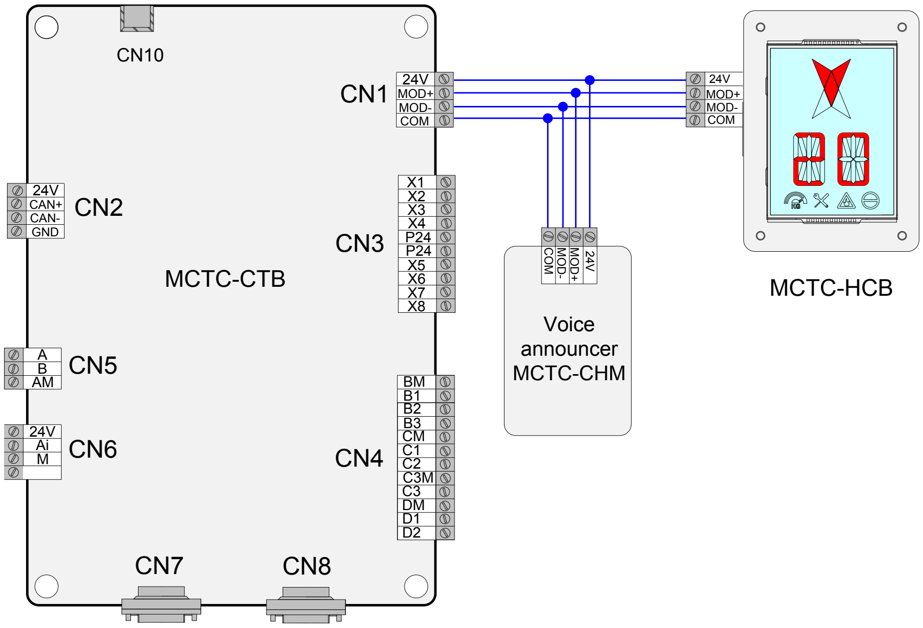


Figure 3-26 RS485 connection between the CTB, CCB, and voice announcer



2. Communication address setting of HCB and CCB

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 CCB and voice announcer, the CCB and voice announcer addresses are 0. The voice announcer need not the address and can be directly used after being connected.

For details on how to set the address of the HCB, see the related description in section 4.4.

The address allocation is as follows:

- 0: CCB address
- 1–40: HCB addresses

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

The NICE3000new 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).

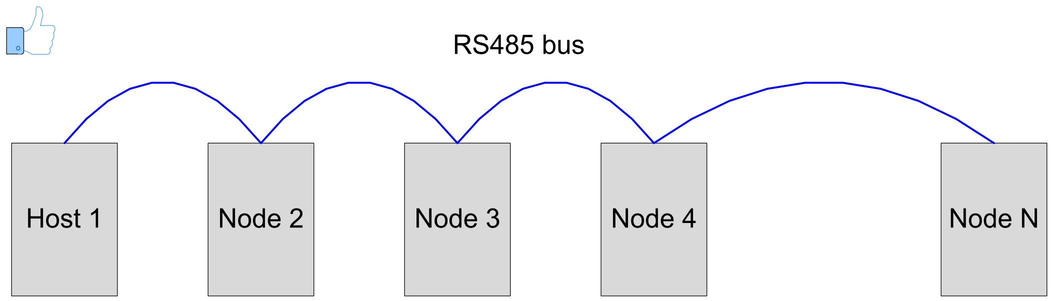
3. Topology requirements

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 figures show the common bus structures.

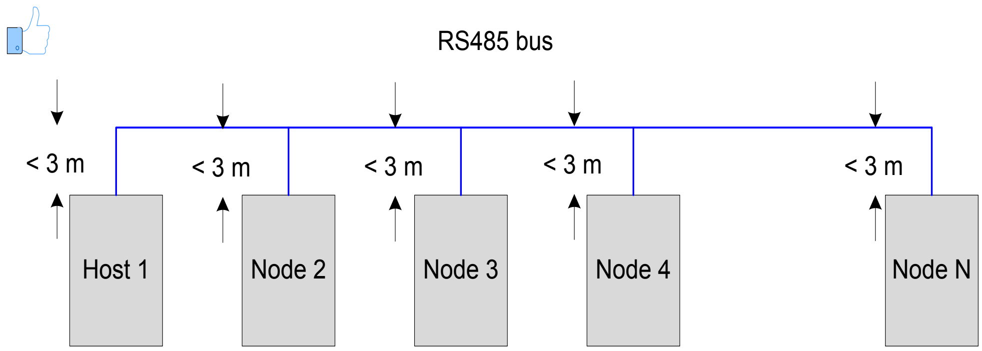
a. Hand-in-hand connection structure

Figure 3-27 Hand-in-hand connection structure



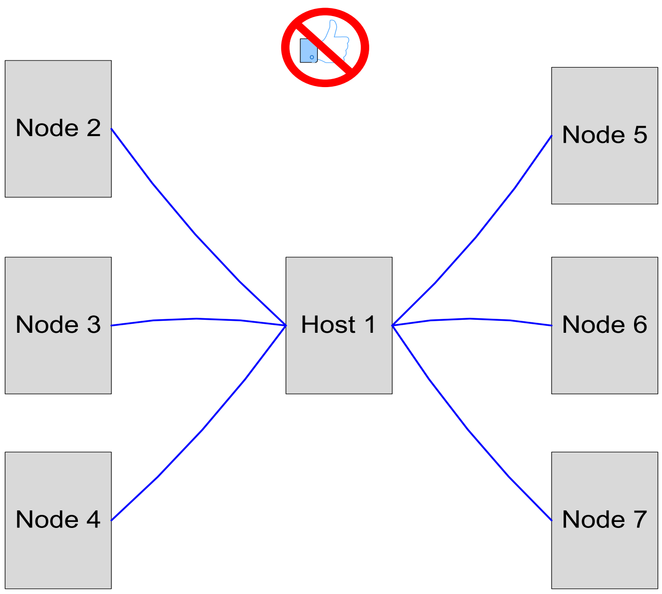
b. Branch connection structure

Figure 3-28 Branch connection structure



c. Wrong structure: star connection structure

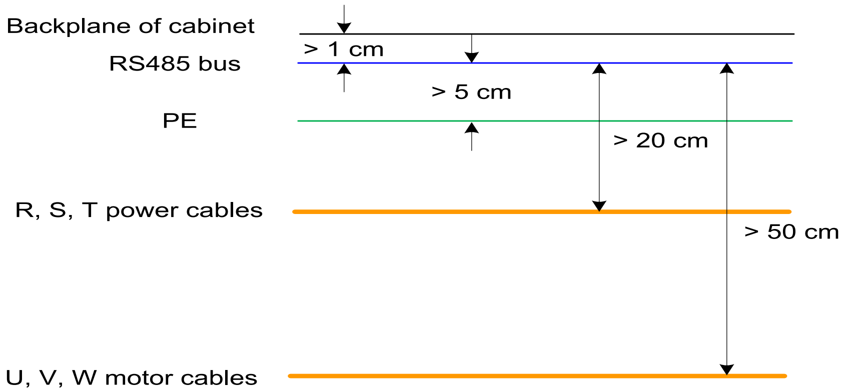
Figure 3-29 Star connection structure (wrong)



4. EMC precautions

- Use the twisted pair as the RS485 communication cable.
- Separate the RS485 bus from other interfering cables during cabling.

Figure 3-30 RS485 cabling diagram



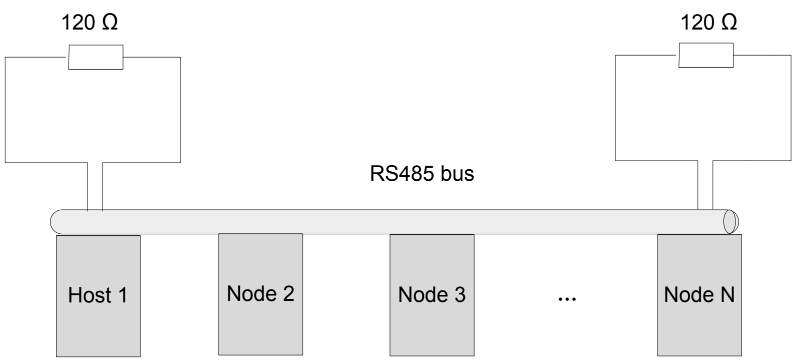
- The distance between the RS485 bus and strong-current cables must be larger than 20 cm.
- The distance between the RS485 bus and U, V, W motor cables must be larger than 50 cm.
- The distance between the RS485 bus and grounding cable must be larger than 5 cm.
- The distance between the RS485 bus and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

3

◆ Problems and Handling

Problem 1: Termination resistor connection

Figure 3-31 Correct termination resistor connection diagram

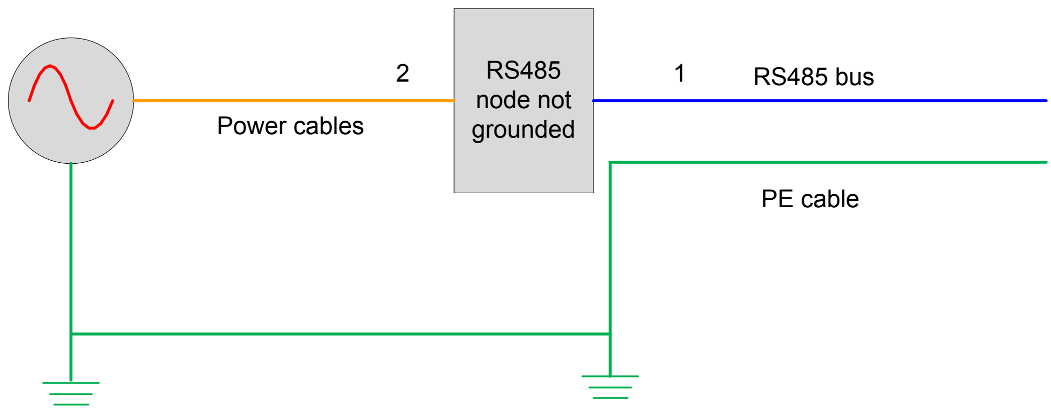


1. The termination resistor can be connected only at two ends of the bus.

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.

Problem 2: Suppressing interference from external system

Figure 3-32 Suppressing external interference



The measures of suppressing external interference are as follows:

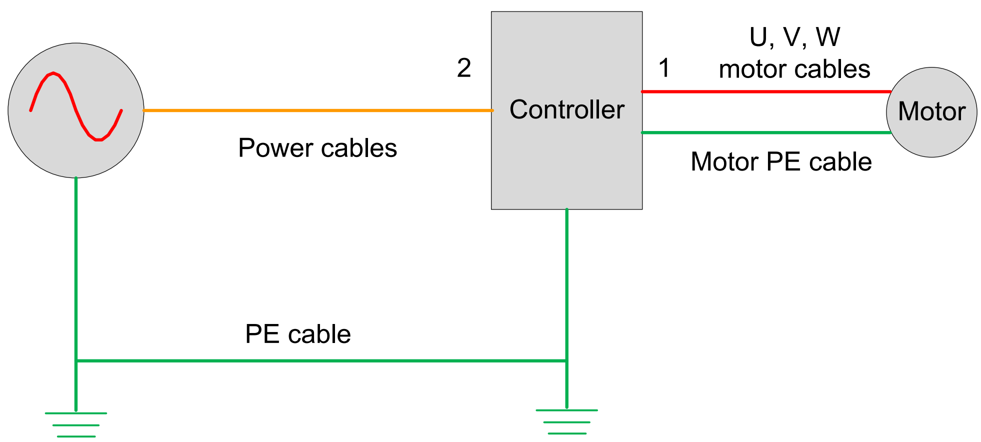
3

1) The recommended method is to add the magnetic ring at position 1, which can effectively suppress external interference.

2) Adding the magnetic ring at position 2 can also suppress external interference.

Problem 3: Suppressing interference from the controller

Figure 3-33 Suppressing interference from the controller



The measures of suppressing interference from the controller are as follows:

1) 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.

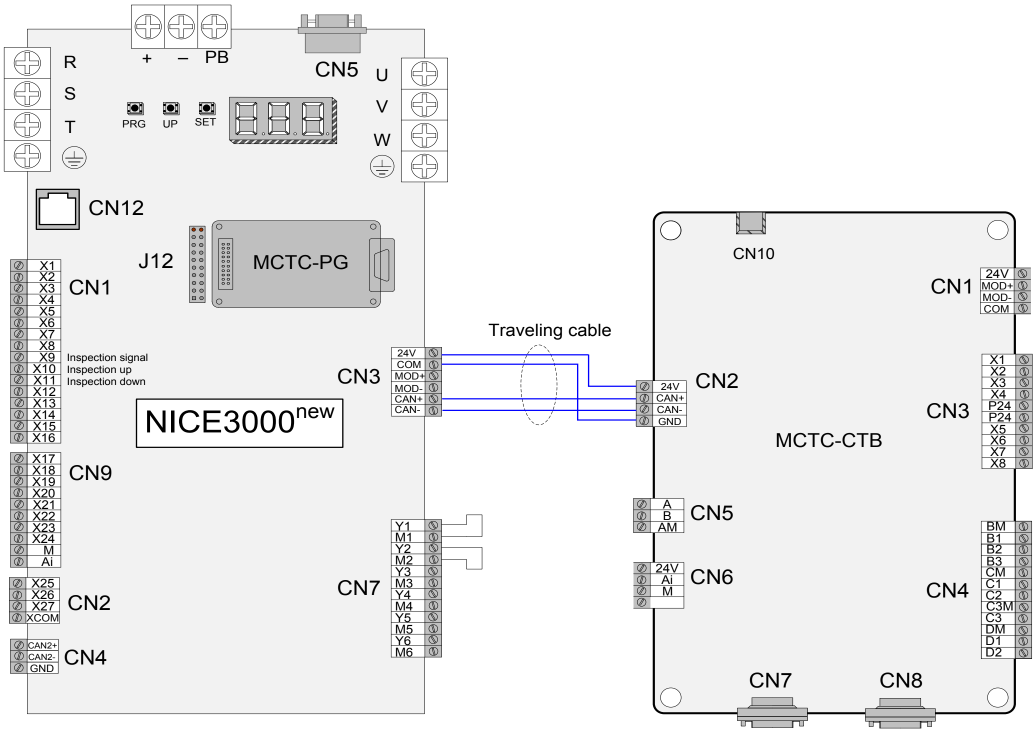
2) The second method is to add the filter magnetic ring at position 2, with the U, V, W cables (not including the PE cable) passing through the magnetic ring and winding three coils.

3.3.5 CAN Communication

◆ Hardware Connection and EMC Precautions

1. CAN hardware connection

Figure 3-34 CAN connection between the controller and the CTB



2. EMC precautions

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

2) 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.

3) The traveling cable must be grounded.

4) Use a four-core cable as the communication cable, with one core connected to 24V, 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.

◆ Problems and Handling

Check the following items related to CAN communication:

- 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.

- 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.

- Check with us whether the protocol is customized special protocol.

3.4 Installation of Shaft Position Signals

In elevator control, to implement landing accurately and running safely, the car position needs to be identified based on shaft position signals.

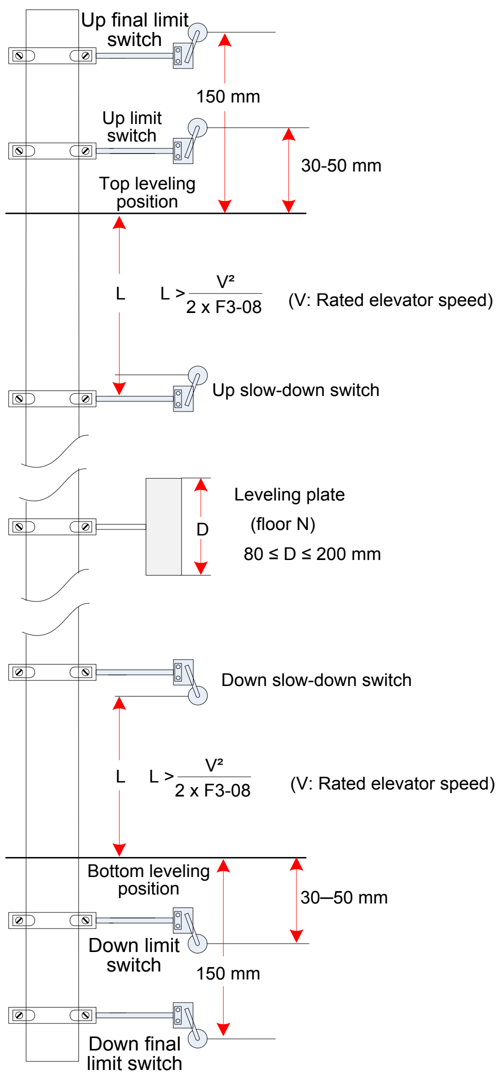
3

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. For the electrical wiring method, refer to Figure 3-11.

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

Figure 3-35 Arrangement of shaft position signals



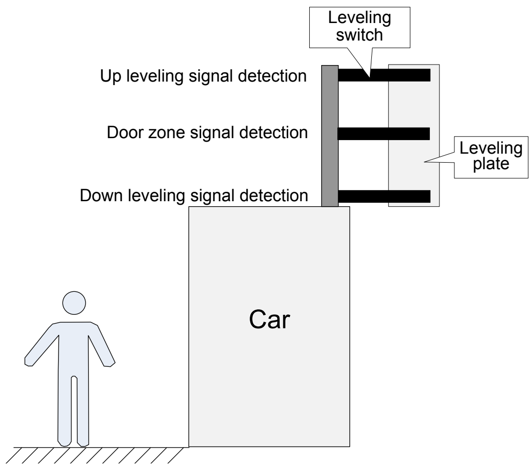
3.4.1 Leveling Signals

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 NICE3000new system supports the installation of 1−3 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.

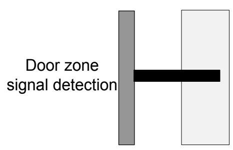
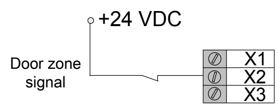
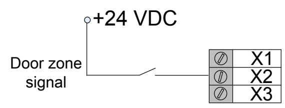
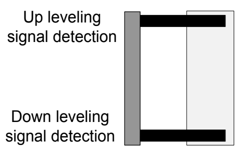
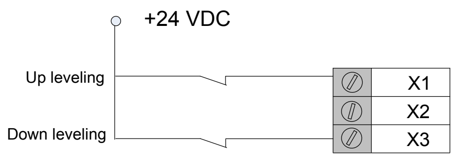
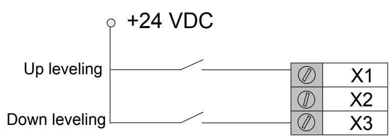
The following figure shows the installation of leveling signals.

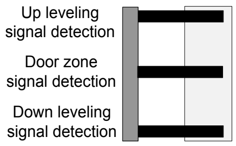
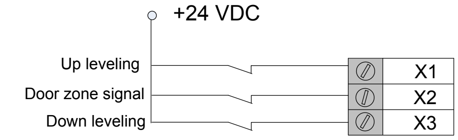
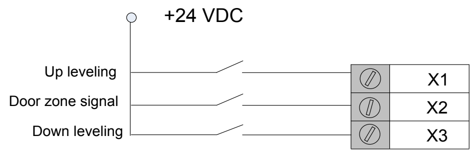
Figure 3-36 Installation of leveling signals



The following table describes the installation requirements of leveling switches

Table 3-11 Installation requirements of leveling switches

Number of Leveling Switches	Installation Method	Connecting to Input Terminals of Controller	Setting of Function Code
1			F5-01 = 0 F5-02 = 35 (NC) F5-03 = 0
			F5-01 = 0 F5-02 = 03 (NO) F5-03 = 0
2			F5-01 = 33 (NC) F5-02 = 0 F5-03 = 34 (NC)
			F5-01 = 01 (NO) F5-02 = 0 F5-03 = 02 (NO)

<table>
<tr><th>Number of Leveling Switches</th><th>Installation Method</th><th>Connecting to Input Terminals of Controller</th><th>Setting of Function Code</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2"></td><td></td><td>F5-01 = 33 (NC)
F5-02 = 35 (NC)
F5-03 = 34 (NC)</td></tr>
<tr><td></td><td>F5-01 = 01 (NO)
F5-02 = 03 (NO)
F5-03 = 02 (NO)</td></tr>
</table>

3.4.2 Slow-Down Switches

The slow-down switch is one of the key protective components of the NICE3000new, protecting the elevator from over travel top terminal or over travel bottom terminal at maximum speed when the elevator position becomes abnormal.

The NICE3000new 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 3-12 Slow-down distances based on different rated elevator speeds

<table>
<tr><td>Rated Elevator Speed (m/s)</td><td>0.25</td><td>0.4</td><td>0.5</td><td>0.63</td><td>0.75</td><td>1</td><td>1.5</td><td>1.6</td><td>1.75</td><td>2</td><td>2.5</td><td>3</td><td>3.5</td><td>4</td></tr>
<tr><td>Distance of Slow-down 1 (m)</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.2</td><td>0.4</td><td>0.7</td><td>1.5</td><td>1.7</td><td>2.0</td><td>2.0</td><td>2.0</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Distance of Slow-down 2 (m)</td><td colspan="9">None</td><td>2.5</td><td>4.0</td><td>4.0</td><td>4.0</td><td>4.0</td></tr>
<tr><td>Distance of Slow-down 3 (m)</td><td colspan="11">None</td><td>6</td><td>8</td><td>11</td></tr>
</table>

"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.

3.4.3 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.

3.4.4 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.

4

Peripheral Devices and Options

Chapter 4 Peripheral Devices and Options

§ Safety Information

DANGER

■ To Prevent Electric Shock

- Never wire the Controller while the power is on.
- Always keep the circuit breaker in the OFF state.

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.

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 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.

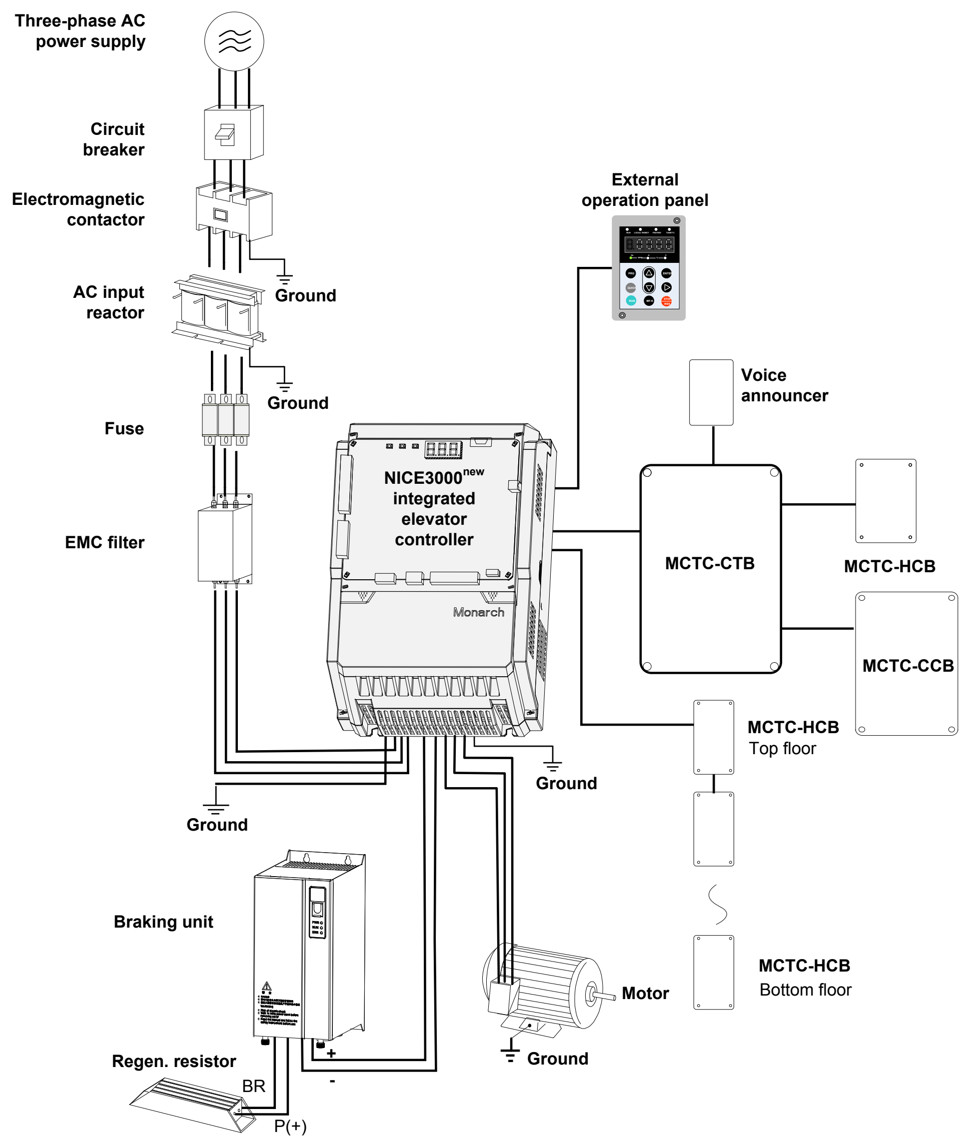
4.1 Peripheral Device Selection Guide

4.1.1 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 4-1 Peripheral device connection diagram



4.1.2 Peripheral Device Descriptions

Table 4-1 Peripheral device descriptions

Peripheral Device	Mounting Position	Function Description
Circuit breaker	Power input side	Molded case circuit breaker (MCCB): 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 circuit breaker 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.

Peripheral Device	Mounting Position	Function Description
AC input reactor	Controller input side	Improve the power factor of the power 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	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	Directly use the regen. resistor for models below 37 kW. Consume regenerative energy during motor deceleration.
Braking unit	37 kW and above	Use Inovance braking unit MDBUN and recommended regen. resistor for models of 37 kW and above. Consume regenerative energy with the regen. resistor during motor deceleration.
dv/dt reactor	Between controller output side and the motor, close to the controller	Provide motor insulation protection and reduces the bearing current.
Common-mode filter	Between controller output side and the motor, close to the controller	Reduce the bearing current.
Motor	Controller output side	Select an appropriate motor according to the recommendation.
DC reactor	-	It is standard configuration for 37 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.

- 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.

4

4.1.3 Peripheral Device Selection

◆ Cable Selection

Table 4-2 Recommended cable sizes

Controller Model	Main Circuit Cable (mm^2)	Control Circuit Cable (mm^2)	Grounding Cable (mm^2)
Single-phase 220 V, range:220–240 V, 50/60 Hz			
NICE-L-C-2002	1	0.75	1
NICE-L-C-2003	2.5	0.75	2.5
220-NICE-L-C-4007	4	0.75	4
220-NICE-L-C-4011	6	0.75	6
220-NICE-L-C-4015	6	0.75	6
220-NICE-L-C-4018	6	0.75	6
220-NICE-L-C-4022	10	0.75	10
220-NICE-L-C-4030	16	0.75	16
Three-phase 220 V, range: 220–240 V, 50/60 Hz			
NICE-L-C-2002	1.5	0.75	1.5
NICE-L-C-2003	2.5	0.75	2.5
220-NICE-L-C-4007	4	0.75	4
220-NICE-L-C-4011	6	0.75	6
220-NICE-L-C-4015	6	0.75	6
220-NICE-L-C-4018	10	0.75	10
220-NICE-L-C-4022	10	0.75	10
220-NICE-L-C-4030	16	0.75	16
Three-phase 380 V, range: 380–440 V, 50/60 Hz			
NICE-L-C-4002	0.75	0.75	0.75
NICE-L-C-4003	1.5	0.75	1.5
NICE-L-C-4005	2.5	0.75	2.5
NICE-L-C-4007	4	0.75	4
NICE-L-C-4011	6	0.75	6
NICE-L-C-4015	6	0.75	6
NICE-L-C-4018	10	0.75	10
NICE-L-C-4022	10	0.75	10
NICE-L-C-4030	16	0.75	16
NICE-L-C-4037	25	1.0	16
NICE-L-C-4045	35	1.0	16
NICE-L-C-4055	50	1.0	25
NICE-L-C-4075	70	1.0	35
NICE-L-C-4090	95	1.0	50
NICE-L-C-4110	120	1.0	60
NICE-L-C-4132	120	1.0	60
NICE-L-C-4160	150	1.0	75

4

◆ Fuse, Contactor, Circuit Breaker, Reactors and Filters

For model selection of the EMC devices such as fuse, contactor, circuit breaker, reactors, and filters, refer to Chapter 12.

◆ Braking Components

The braking components are common optional parts provided by Inovance. For details, see section 4.3.

◆ Adaptable Motor

Table 4-3 Adaptable motor selection

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Adaptable 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-4022	10.6	42.6	27.7	11
220-NICE-L-C-4030	13.1	52.6	34.6	15
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-4022	18.3	49.0	48.0	15.0
220-NICE-L-C-4030	23.0	62.0	60.0	18.5
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-4022	30.0	49.5	48.0	22.0
NICE-L-C-4030	40.0	62.0	60.0	30.0
NICE-L-C-4037	57.0	77.0	75.0	37.0
NICE-L-C-4045	69.0	93.0	91.0	45.0

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Adaptable Motor (kW)
NICE-L-C-4055	85.0	113.0	112.0	55.0
NICE-L-C-4075	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

4.2 List of Options

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

Table 4-4 Options of the NICE3000new

Name	Model	Function	Remark
External braking unit	MDBUN	It is provided for the modes of 37 kW and above.	For details, see section 4.3.
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 differential encoder and applied to synchronous motor. It requires 5 V power supply.	-
	MCTC-PG-E	It is used to adapt to the SIN/COS encoder.	-
	MCTC-PG-F1	It is used to adapt to the absolute encoder (Heidenhain ECN413/1313).	-
Car top board (CTB)	MCTC-CTB	The MCTC-CTB is the car control board of the NICE3000new. It has 8 DIs, 1 AI and 9 relay outputs (7 as 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.	A number of HCB models are available. For details, see section 4.4.
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 alls and outputs the call indicator state.	-
Group control board (GCB)	MCTC-GCB	The MCTC-GCB is used together with the NICE3000new to implement group control of multiple elevators.	-
External LED operation panel	MDKE	It is the external LED display and operation panel.	It provides the RJ45 interface for connecting to the controller.
LED operator	MDKE6	It is the external LED display and operation panel.	It can be used for copying parameter.
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.

4.3 Braking Components

1. Model selection

Table 4-5 Braking component selection

Controller Model	Power of Adaptable Motor (kW)	Max. Resistance (Ω)	Min. Resistance (Ω)	Power of Regen. Resistor (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-4022	11.0	18.0	16.0	3500	Built-in
220-NICE-L-C-4030	15.0	13.0	13.0	4500	
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-4022	15.0	13.0	12.5	4500	
220-NICE-L-C-4030	18.5	12.5	12.0	5500	
220-NICE-L-C-4037	22.0	7.5	6.0	6500	MDBUN-60-2T
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 x 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-4022	22	24	22	6500	
NICE-L-C-4030	30	20	16	9000	
NICE-L-C-4037	37	16.0	13	11000	MDBUN-60-T
NICE-L-C-4045	45	14.0	11	13500	MDBUN-60-T
NICE-L-C-4055	55	12.0	10	16500	MDBUN-90-T
NICE-L-C-4075	75	16 x 2	13 x 2	12000 x 2	MDBUN-60-T x 2
NICE-L-C-4090	90	14 x 2	13 x 2	13500 x 2	MDBUN-60-T x 2
NICE-L-C-4110	110	12 x 2	9 x 2	18000 x 2	MDBUN-90-T x 2
NICE-L-C-4132	132	13.5 x 3	10.5 x 3	14000 x 3	MDBUN-90-T x 3
NICE-L-C-4160	160	12 x 3	9 x 3	18000 x 3	MDBUN-90-T x 3

NOTE

1. The preceding configuration takes the synchronous motor as an example. The asynchronous motor has poor energy transfer efficiency, and you can reduce the power of the regen. resistor or increase the resistance of the regen. resistor.

2. It is recommended that you select the regen. resistor closest to the minimum resistance.

3. "x 2" indicates that two sets are required. Take NICE-L-C-4110 as an example: "9 x 2, 18000 x 2, MDBUN-90-T x 2" indicates that two sets of (9 Ω, 15000 W) regen. resistor + MDBUN-90-T braking unit are connected in parallel to the controller. "x 3" indicates that three sets are required.

2. Mounting dimensions

Figure 4-2 Mounting dimensions of the braking unit

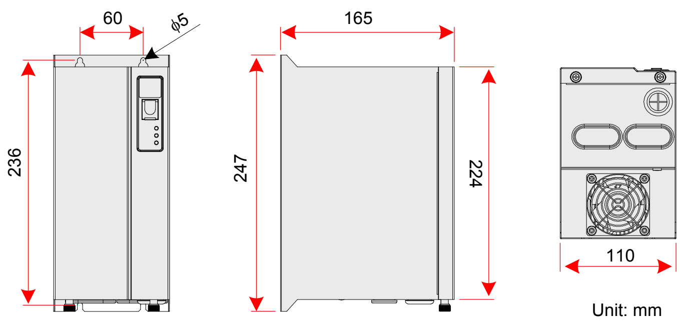
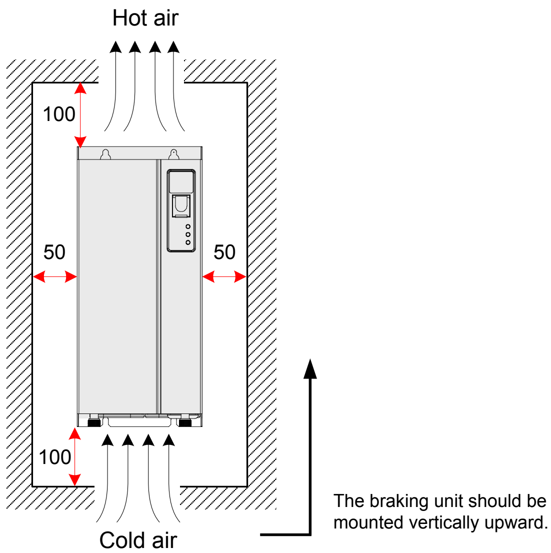


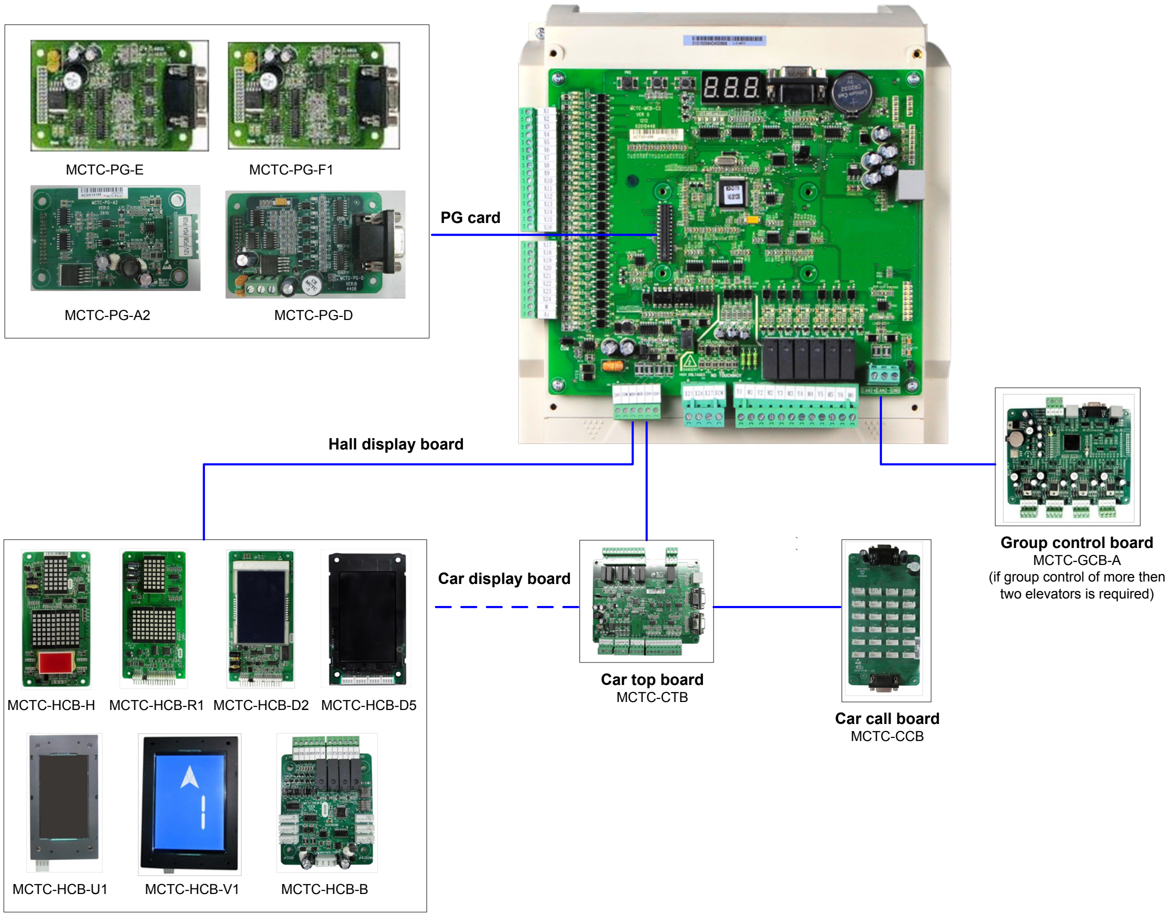
Figure 4-3 Clearance around the braking unit for mounting



For use and installation of the MDBUN series braking unit, refer to the MDBUN Series Braking Unit User Manual.

4.4 Optional Boards

The following figure shows the connection the optional boards to the controller.



4.4.1 CTB Board (MCTC-CTB)

1. Appearance and mounting

The car top board (MCTC-CTB) is the elevator car control board of the NICE3000^{new}. It includes 8 DI terminals, 1 AI terminal, and 9 relay output terminals (standard: 7). The following figures show the appearance and dimensions and installation method of the CTB.

Figure 4-4 Appearance and dimensions of the CTB

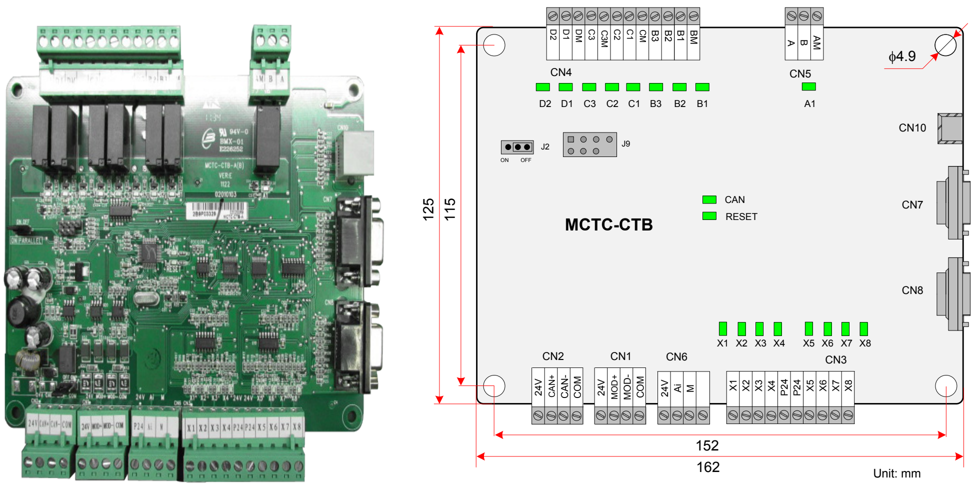
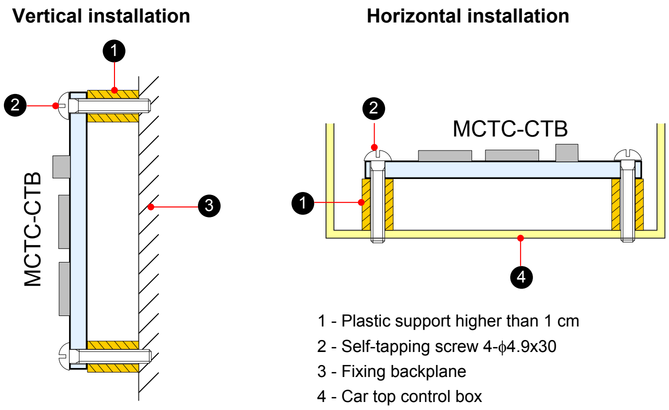


Figure 4-5 Installation method of the CTB (unit: mm)

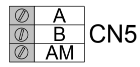
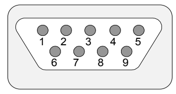
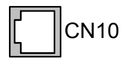
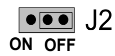
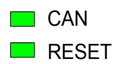
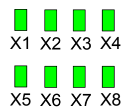
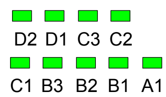


2. Wiring of CTB Terminals

Table 4-6 Wiring description of CTB terminals

Mark		Terminal Name	Function Description	Terminal Arrangement
CN2	+24V/COM	External 24 VDC power supply	24 VDC power supply for the entire CTB	24V CAN+ CAN- COM 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	24V MOD+ MOD- COM CN1
	MOD+/ MOD-	Modbus communication	Connecting the HCB for Modbus communication	
CN6	Ai-M	Load cell signal input	0–10 VDC	24V Ai M CN6
CN3	P24	24 VDC power supply	DI common terminal	X1 X2 X3 X4 P24 P24 X5 X6 X7 X8 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	BM B1 B2 B3 CM C1 C2 C3M C3 DM D1 D2 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		

4

Mark		Terminal Name	Function Description	Terminal Arrangement
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	
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 operation panel	
J2		CTB address jumper in parallel control	Setting the CTB addresses: Short OFF or do not connect the terminal for a single elevator. For the setting in parallel control, see section 6.2.3.	
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.	
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, B1 to B3, C1 to C3, D1 to D2		Relay output indicator	This indicator is on (green) when the system output is active.	
J9		Reserved	It is factory reserved. Do not short it randomly. Otherwise, the controller may not be used properly.	-

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.

4.4.2 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.

Monarch provides many types of display boards. The following part describes only a few 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, contact us.

The common types to be described are listed in the following table.

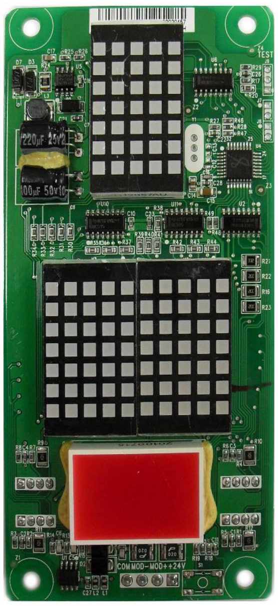
Table 4-7 Common HCB types

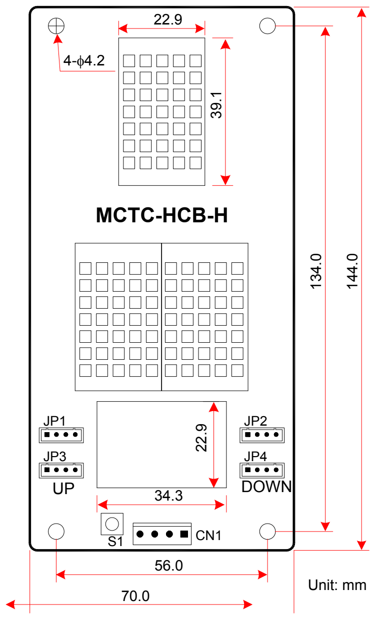
Type	Description	Size (mm)
HCB-H	Dot-matrix display board (red)	144 x 70 x 18
HCB-R1	Ultrathin dot-matrix display board (red)	144 x 70 x 10
HCB-D2	Ultrathin segment LCD display board (blue background white display)	144 x 70 x 10
HCB-D5	Ultrathin segment LCD display board (black background white display)	136.5 x 76 x 9.3
HCB-U1	4.3-inch segment LCD display board (blue background white display)	143.5 x 79.2 x 9.4
HCB-V1	6.4-inch segment LCD display board (blue background white display)	131 x 184.6 x 14.2
HCB-B	No-display hall call board	70 x 84 x 20

◆ HCB-H (Dot-Matrix Display Board)

The following figure shows the appearance and dimensions of HCB-H.

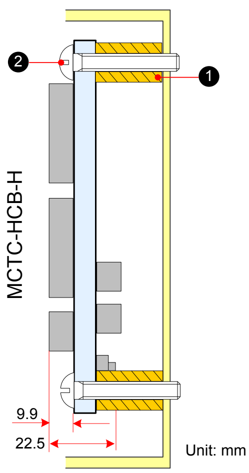
Figure 4-6 Appearance and dimensions of HCB-H





The following figure shows the installation method of HCB-H.

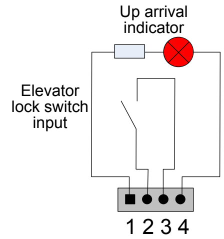
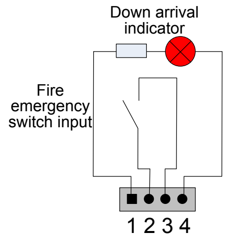
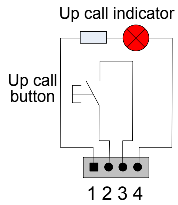
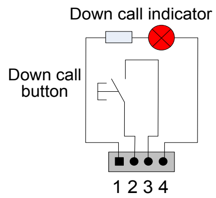
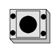
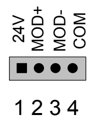
Figure 4-7 Installation method of HCB-H



1 - Plastic support higher than 1 cm
2 - Self-tapping screw 4-ϕ4.9x30

The following table describes the input and output terminals of HCB-H.

Table 4-8 Input and output terminals of HCB-H

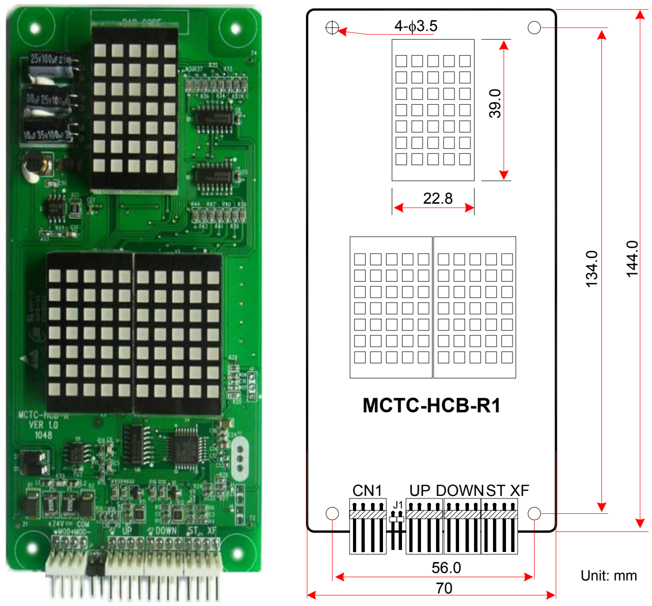
Terminal Name	Function	Terminal Wiring
JP1	Interface for the elevator lock switch and up arrival indicator Pins 2 and 3 are for switch input. Pins 1 and 4 are output of the up arrival indicator (24 VDC output, load capacity: 40 mA).	
JP2	Interface for the fire emergency switch and down arrival indicator 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 and indicator 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 and indicator 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.	 S1
CN1	Modbus communication and power supply terminal Pins 2 and 3 are for Modbus communication. Pins 1 and 4 are for DC power supply.	

4

◆ HCB-R1 (Ultrathin Dot-Matrix Display Board)

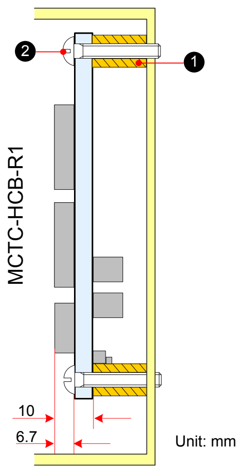
The following figure shows the appearance and dimensions of HCB-R1.

Figure 4-8 Appearance and dimensions of HCB-R1



The following figure shows the installation method of HCB-R1.

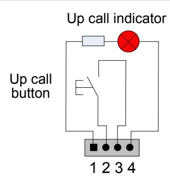
Figure 4-9 Installation method of HCB-R1

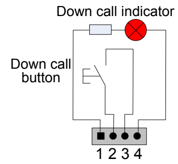
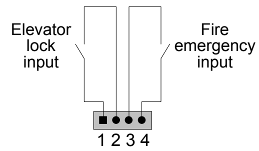
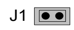
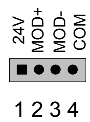


1 - Plastic support higher than 1 cm
2 - Self-tapping screw 4-ϕ4.9x30

The following table describes the input and output terminals.

Table 4-9 Input and output terminals of HCB-R1

Terminal Name	Function	Terminal Wiring
UP	Interface for the up call button and indicator 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).	

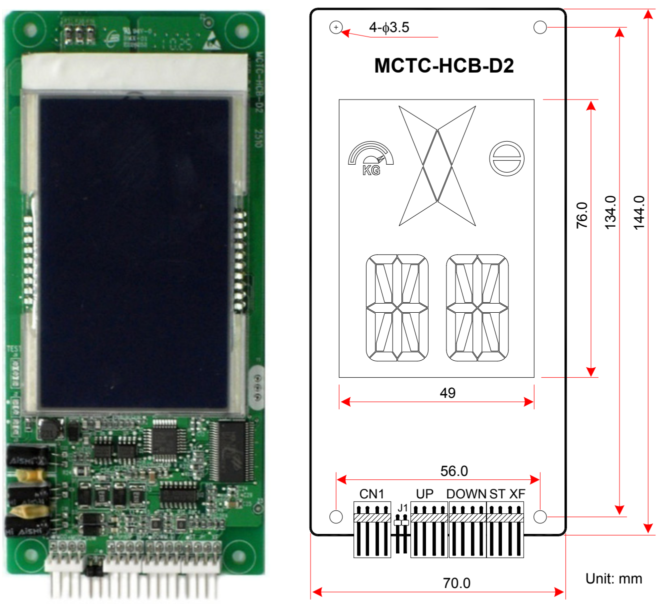
Terminal Name	Function	Terminal Wiring
DOWN	Interface for the down call button and indicator Pins 2 and 3 are for down call input. Pins 1 and 4 are power supply for the down call indicator (24 VDC output, load capacity: 40 mA).	
XF/ST	Interface for the fire emergency and elevator lock switches Pins 1 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 DC power supply.	

4

◆ HCB-D2 (Ultrathin Segment LCD Display Board)

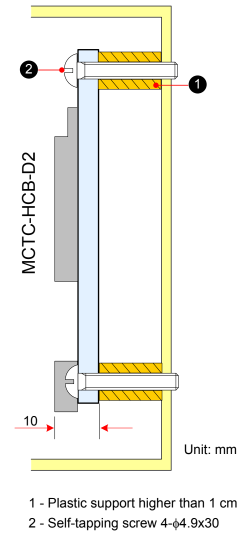
The following figure shows the appearance and dimensions of HCB-D2.

Figure 4-10 Appearance and dimensions of HCB-D2



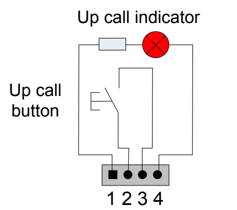
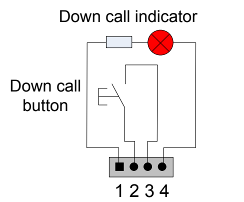
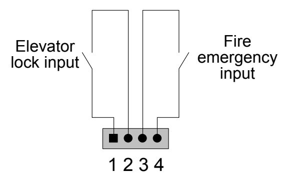
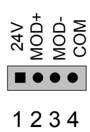
The following figure shows the installation method of HCB-D2.

Figure 4-11 Installation method of HCB-D2



The following table describes the input and output terminals of HCB-D2.

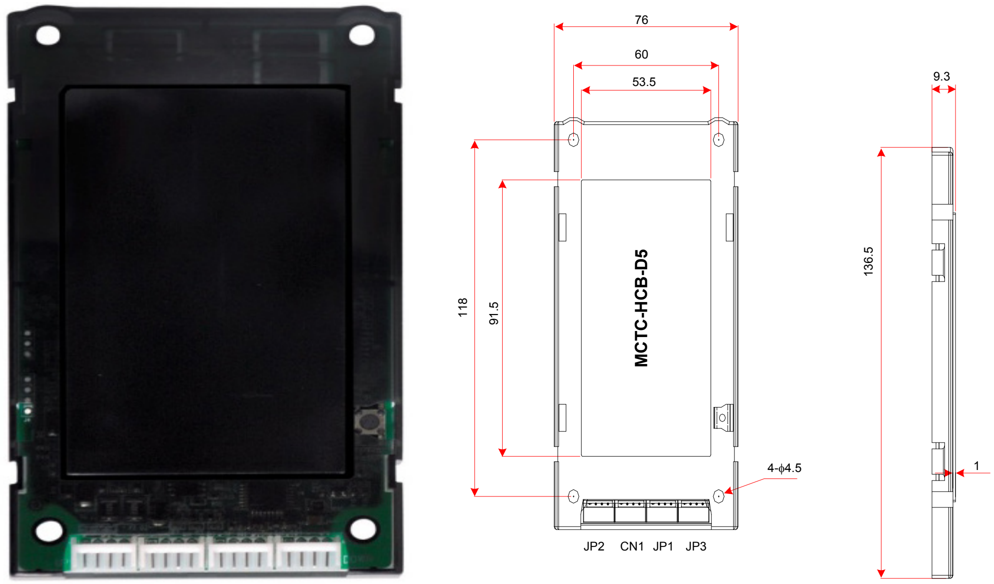
Table 4-10 Input and output terminals of HCB-D2

Terminal Name	Function	Terminal Wiring
UP	Interface for the up call button and indicator 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 and indicator 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 switch 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.	

◆ HCB-D5 (Ultrathin Segment LCD Display Board)

The following figure shows the appearance and dimensions of HCB-D5.

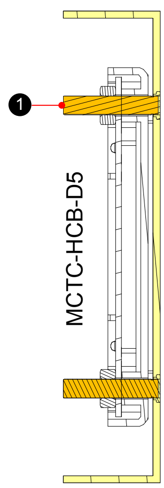
Figure 4-12 Appearance and dimensions of HCB-D5



4

The following figure shows the installation method of HCB-D5.

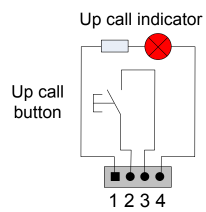
Figure 4-13 Installation method of HCB-D5

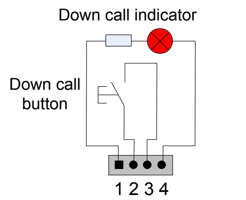
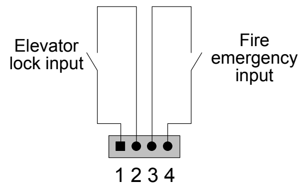
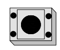
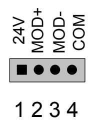


1 - 4-M4x18 screw

The following table describes the input and output terminals of HCB-D5.

Table 4-11 Input and output terminals of HCB-D5

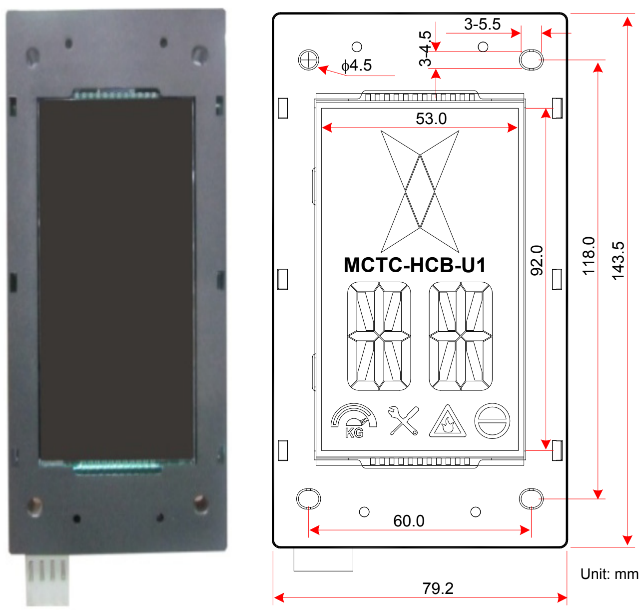
Terminal Name	Function	Terminal Wiring
JP2	Interface for the up call button and indicator Pins 2 and 3 are for up call input. Pins 1 and 4 are power supply for the up call indicator (24 VDC output, load capacity: 40 mA).	

Terminal Name	Function	Terminal Wiring
JP3	Interface for the down call button and indicator 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).	
JP1	Interface for the fire emergency and elevator lock switch Pins 1 and 2 are for elevator lock input. Pins 3 and 4 are for fire emergency input.	
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.	 S1
CN1	Modbus communication and power supply terminal. Pins 2 and 3 are for Modbus communication. Pins 1 and 4 are for power supply.	

◆ HCB-U1 (4.3-inch Segment LCD Display Board)

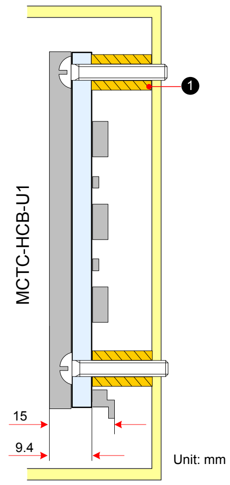
The following figure shows the appearance and dimensions of HCB-U1.

Figure 4-14 Appearance and dimensions of HCB-U1



The following figure shows the installation method of HCB-U1.

Figure 4-15 Installation method of HCB-U1

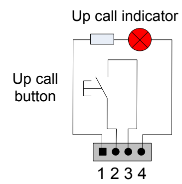
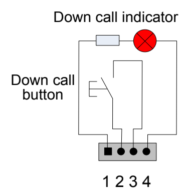
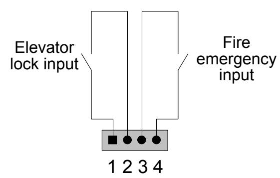
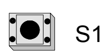
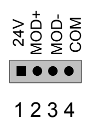


1 - Plastic support higher than 1 cm
2 - Self-tapping screw 4-ϕ4.9x30

4

The following table describes the input and output terminals of HCB-U1.

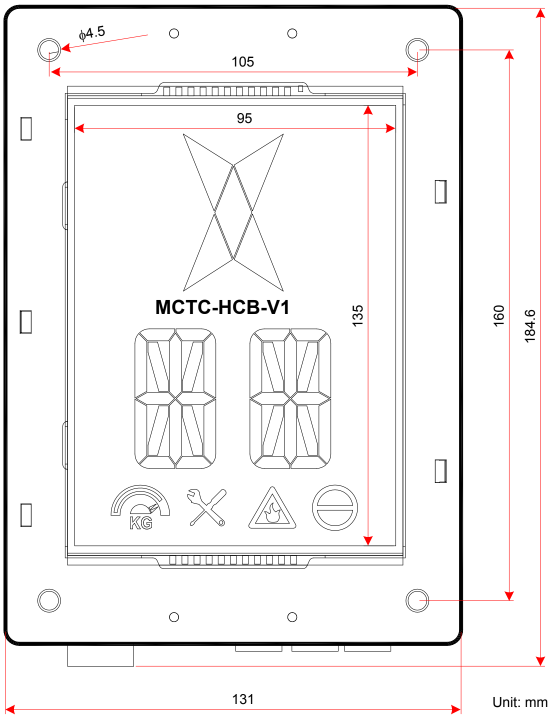
Table 4-12 Input and output terminals of HCB-U1

Terminal Name	Function	Terminal Wiring
J1	Interface for the up call button and indicator 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).	
J2	Interface for the down call button and indicator 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).	
J3	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.	
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 therefore 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 DC power supply.	

◆ HCB-V1 (6.4-inch Segment LCD Display Board)

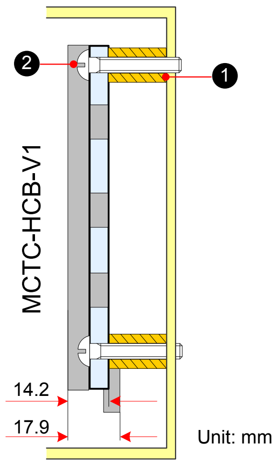
The following figure shows the appearance and dimensions of HCB-V1.

Figure 4-16 Appearance and dimensions of HCB-V1



The following figure shows the installation method of HCB-V1.

Figure 4-17 Installation method of HCB-V1

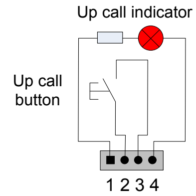
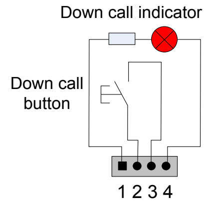
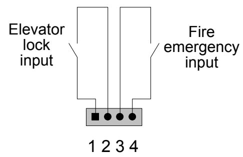
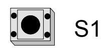
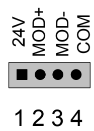


1 - Plastic support higher than 1 cm

2 - Self-tapping screw 4-ϕ4.9x30

The following table describes the input and output terminals of HCB-V1.

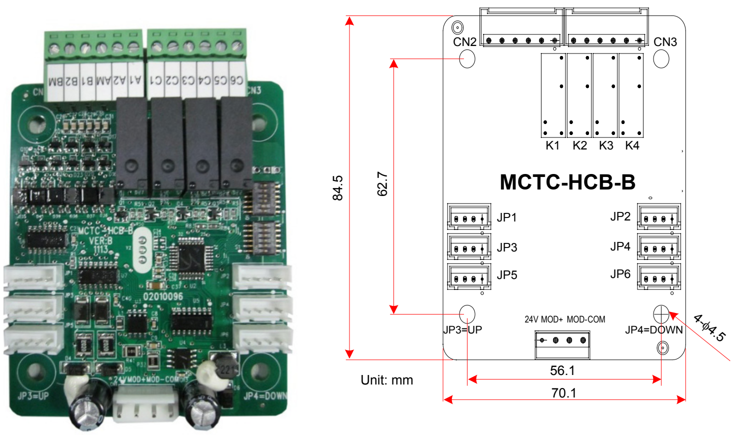
Table 4-13 Input and output terminals of HCB-V1

Terminal Name	Function	Terminal Wiring
J1	Interface for the up call button and indicator 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).	
J2	Interface for the down call button and indicator 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).	
J3	Interface for the fire emergency and elevator lock switch Pins 1 and 2 are for elevator lock input. Pins 3 and 4 are for fire emergency input.	
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 therefore 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 DC power supply.	

◆ HCB-B (No Display Hall Call Board)

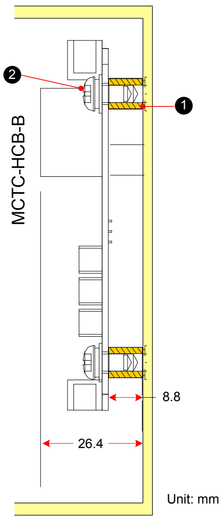
The following figure shows the appearance and dimensions of HCB-B.

Figure 4-18 Appearance and dimensions of HCB-B



The following figure shows the installation method of HCB-B.

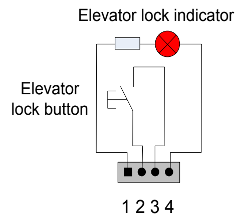
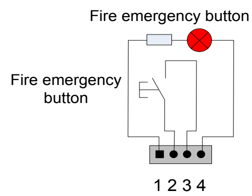
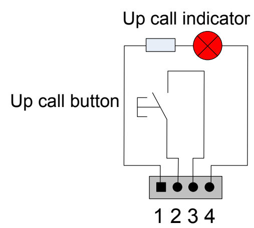
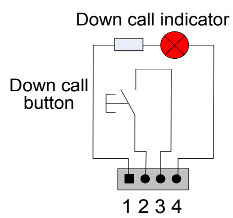
Figure 4-19 Installation method of HCB-B

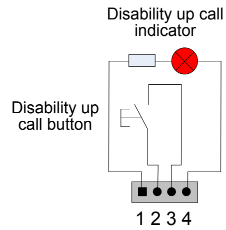
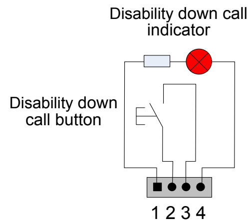
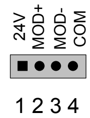
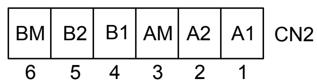


1 - Plastic support higher than 1 cm
2 - Combination screw M4x10

The following table describes the input and output terminals of HCB-B.

Table 4-14 Input and output terminals of HCB-B

Terminal Name	Function	Terminal Wiring
JP1	Interface for the elevator lock switch Pins 2 and 3 are for switch input. Pins 1 and 4 are for output of the elevator lock indicator.	
JP2	Interface for the fire emergency switch Pins 2 and 3 are for switch input. Pins 1 and 4 are for output of the fire emergency indicator.	
JP3	Interface for the up call button and indicator Pins 2 and 3 are for up call input. Pins 1 and 4 are power supply for the up call indicator.	
JP4	Interface for the down call button and indicator Pins 2 and 3 are for down call input. Pins 1 and 4 are power supply for the down call indicator.	

Terminal Name	Function	Terminal Wiring
JP5	Interface for the disability up call button and indicator Pins 2 and 3 are for up call input. Pins 1 and 4 are power supply for the up call indicator.	
JP6	Interface for the disability down call button and indicator Pins 2 and 3 are for down call input. Pins 1 and 4 are power supply for the down call indicator.	
CN1	Modbus communication and power supply terminal Pins 2 and 3 are for Modbus communication. Pins 1 and 4 are for DC power supply.	
CN2	Relay output For the definition of the pins, see Table 4-15.	

The HCB-B provides four relay outputs, K1, K2, K3, and K4, provided by CN2 terminals.

Table 4-15 Relay output and pin definition of CN2

Relay	CN2 Pin	Common	Function Description
K1	A1	AM	Up arrival indicator
K2	A2	AM	Down arrival indicator
K3	B1	BM	Up arrival gong
K4	B2	BM	Down arrival gong

The DIP switch S1 is used to set the floor address of the HCB-B, as described in the following table.

Table 4-16 Floor address setting by S1

S1	Floor Address Setting, Range: 0–63
S1.1	Floor address selection Bit0
S1.2	Floor address selection Bit1
S1.3	Floor address selection Bit2
S1.4	Floor address selection Bit3
S1.5	Floor address selection Bit4
S1.6	Floor address selection Bit5

The DIP switch S2 is used to select the function of the HCB-B, as described in the following table.

Table 4-17 S2 description

S2	Function
S2.1	Modbus termination resistor setting
S2.2	HCB-B function selection
S2.3	HCB-B function selection

S2	Function
S2.4	For test
S2.5	HCB-B function selection
S2.6	HCB-B function selection

The HCB-B provides nine functions, which can be set according to the following table.

Table 4-18 Function setting of the HCB-B

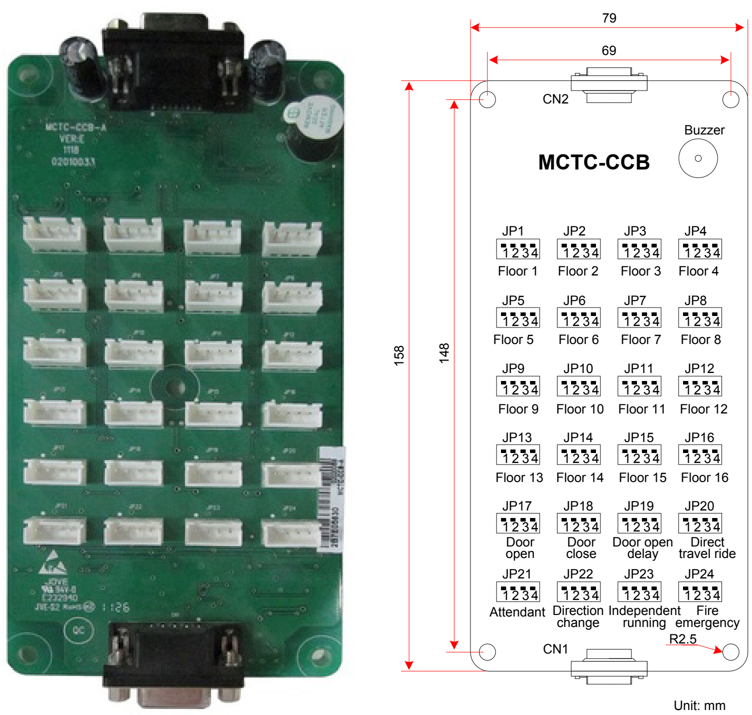
HCB-B Function	S2.6	S2.5	S2.3	S2.2
1. HCB-B function	OFF	OFF	ON	OFF
2. Binary output	OFF	OFF	OFF	ON
3. 7-segment function	OFF	OFF	OFF	OFF
4. BCD output	OFF	ON	OFF	OFF
5. Binary output with letter	OFF	ON	OFF	ON
6. Disability function output	OFF	ON	ON	OFF
7. In-car extension output	OFF	ON	ON	ON
8. In-car output based on physical floor (binary output)	ON	OFF	OFF	ON
9. Indication by hall arrival gong and indicator	ON	OFF	OFF	OFF

4.4.3 CCB Board (MCTC-CCB)

The car call board (MCTC-CCB) is another interface between users and the control system. 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.

The following figure shows the appearance and dimensions of the CCB.

Figure 4-20 Appearance and dimensions of the CCB



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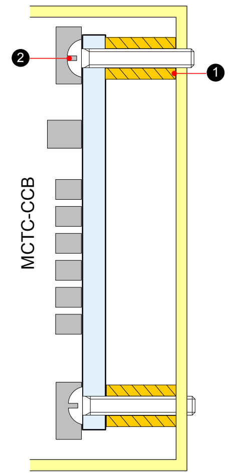
The following figure shows the installation method of the CCB.

Figure 4-21 Installation method of the CCB



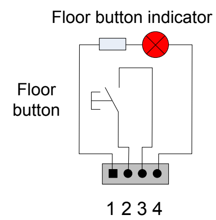
1 - Plastic support higher than 1 cm

2 - Self-tapping screw 4-ϕ4.9x30

4

The following table describes the input and output terminals of the CCB.

Table 4-19 Input and output terminals of the CCB

No.	Interface	Pins 2 and 3	Pins 1 and 4	Remarks
1	JP1	Floor 1 button input	Floor 1 display output	 For CCB2, the input signal of JPn corresponds to floor (16+n) button input.
2	JP2	Floor 2 button input	Floor 2 display output	
3	JP3	Floor 3 button input	Floor 3 display output	
4	JP4	Floor 4 button input	Floor 4 display output	
5	JP5	Floor 5 button input	Floor 5 display output	
6	JP6	Floor 6 button input	Floor 6 display output	
7	JP7	Floor 7 button input	Floor 7 display output	
8	JP8	Floor 8 button input	Floor 8 display output	
9	JP9	Floor 9 button input	Floor 9 display output	
10	JP10	Floor 10 button input	Floor 10 display output	
11	JP11	Floor 11 button input	Floor 11 display output	
12	JP12	Floor 12 button input	Floor 12 display output	
13	JP13	Floor 13 button input	Floor 13 display output	
14	JP14	Floor 14 button input	Floor 14 display output	
15	JP15	Floor 15 button input	Floor 15 display output	
16	JP16	Floor 16 button input	Floor 16 display output	
17	JP17	Door open button input	Door open display output	Invalid for CCB2.
18	JP18	Door close button input	Door close display output	
19	JP19	Door open delay button input	Door open delay display output	
20	JP20	Direct travel ride input	Non-door zone stop output	
21	JP21	Attendant input	Reserved	
22	JP22	Direction change input	Reserved	
23	JP23	Independent running input	Reserved	
24	JP24	Fire emergency input	Reserved	

No.	Interface	Pins 2 and 3	Pins 1 and 4	Remarks
Note: Pins 1 and 2 are positive of power supply. The pin with white dot mark or that is rectangular is pin 1.				

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.

4.4.4 GCB Board (MCTC-GCB)

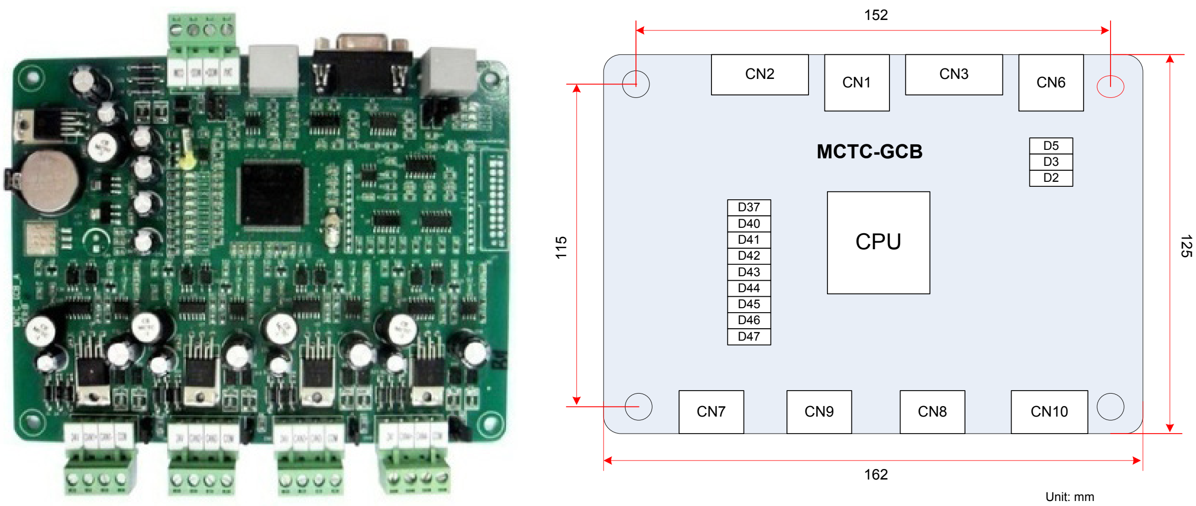
With together use of the group control board (GCB), the NICE3000new supports group control of elevators.

A single 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.

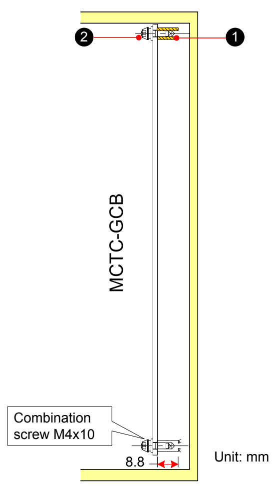
The following figure shows the appearance and dimensions of the GCB.

Figure 4-22 Appearance and dimensions of the GCB



The following figure shows the installation method of the GCB.

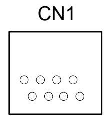
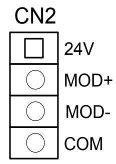
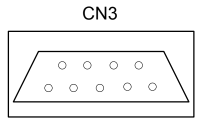
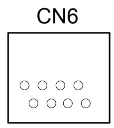
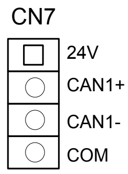
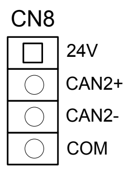
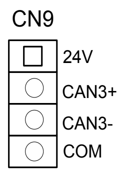
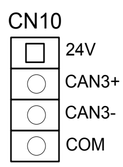
Figure 4-23 Installation method of the GCB



1 - Plastic support higher than 1 cm
2 - Combination screw M4x10

The following table describes the input and output terminals of the GCB.

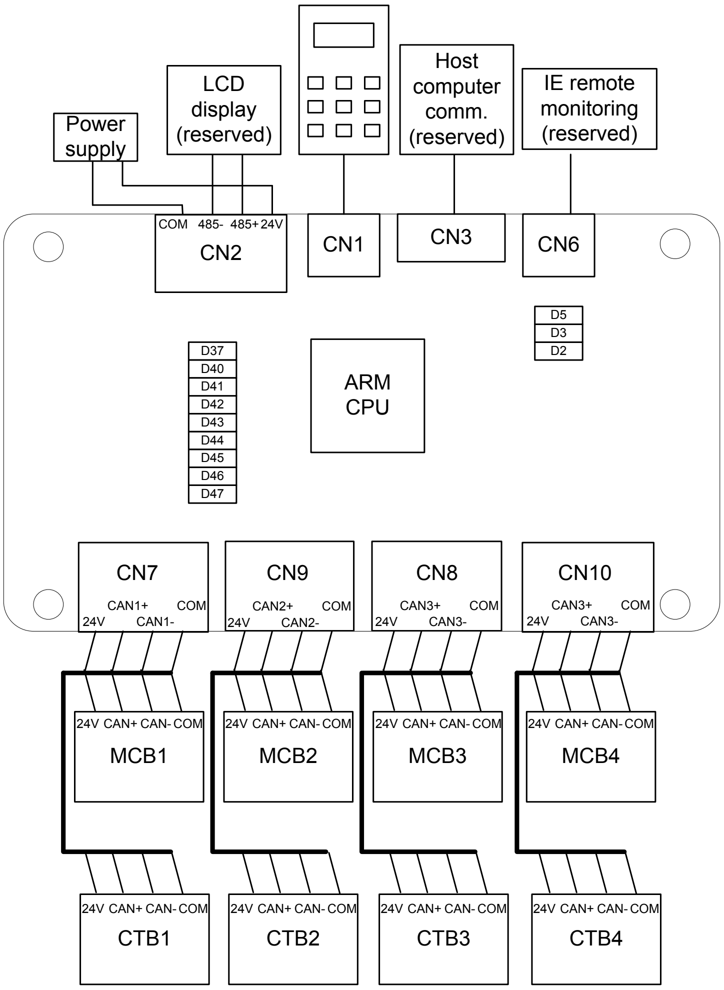
Table 4-20 Input and output terminals of the GCB

Mark		Terminal Name	Function Description	Terminal Arrangement
CN1		Operation panel interface	Connecting the external operation panel	
CN2	+24V/COM	24 VDC output	24 VDC power supply for the entire GCB	
	MOD+/MOD-	Modbus communication terminal	LCD display and extension functions	
CN3		232 interface	Communicating with the host computer.	
CN6		Reserved	-	
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 each elevator in group control	
CN8	+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 each elevator in group control	
CN9	+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 each elevator 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 each elevator in group control	

4

The following figure shows the typical application of the GCB.

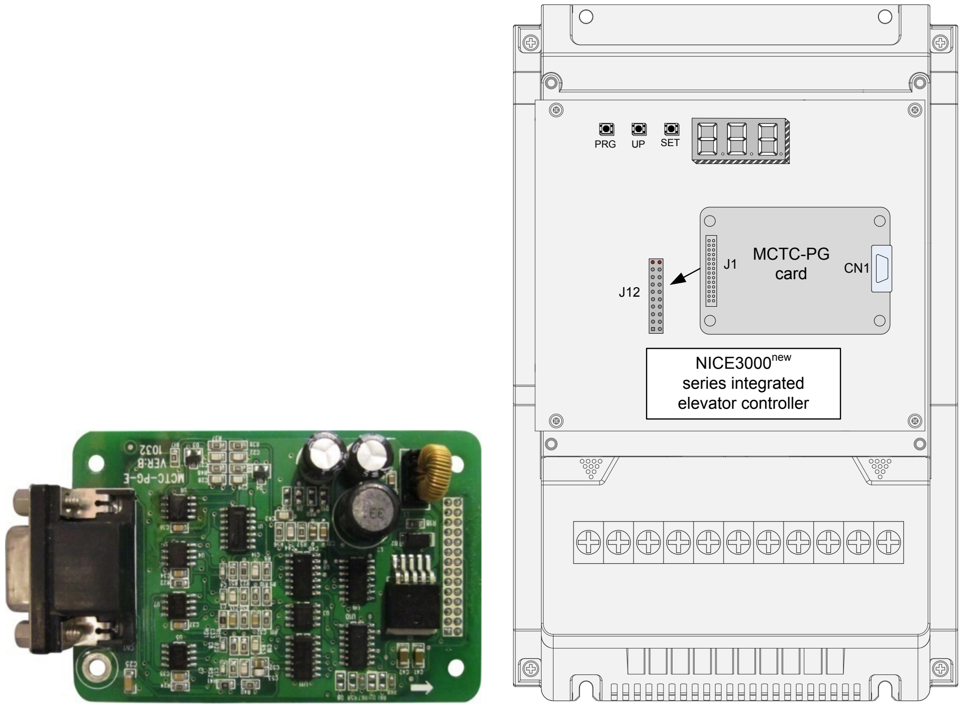
Figure 4-24 Typical application of the GCB



4.5 PG Card and Encoder

The NICE3000^{new} can implement CLVC only with use of the MCTC-PG card. The following figures show 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 4-25 Appearance of the MCTC-PG card and its installation on the controller

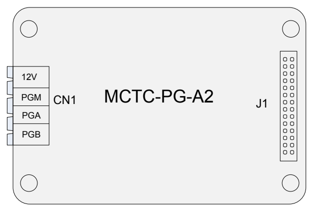
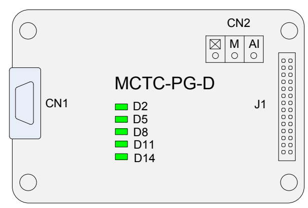
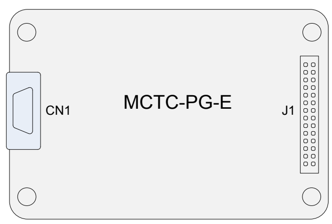


4

4.5.1 Selection of MCTC-PG Cards

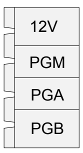
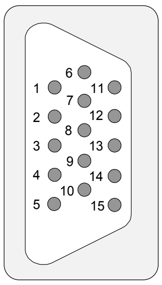
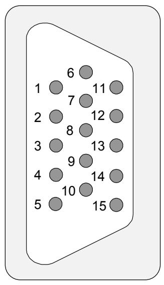
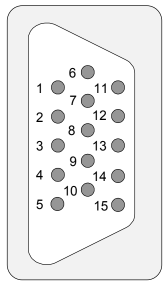
Monarch provides four PG card models, MCTC-PG-A2, MCTC-PG-D, MCTC-PG-E and MCTC-PG-F1 for different encoder types, as described in the following table.

Table 4-21 Selection of the MCTC-PG card models

Encoder Type	Adaptable PG Card	Appearance
Push-pull encoder Open-collector incremental encoder	MCTC-PG-A2	
UVW encoder	MCTC-PG-D	
SIN/COS encoder	MCTC-PG-E	

Encoder Type	Adaptable PG Card	Appearance
Absolute encoder (ECN413/1313)	MCTC-PG-F1	

Table 4-22 Definitions of the CN1 terminals of different MCTC-PG card models

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

4.5.2 Connection Between PG Card and Encoder

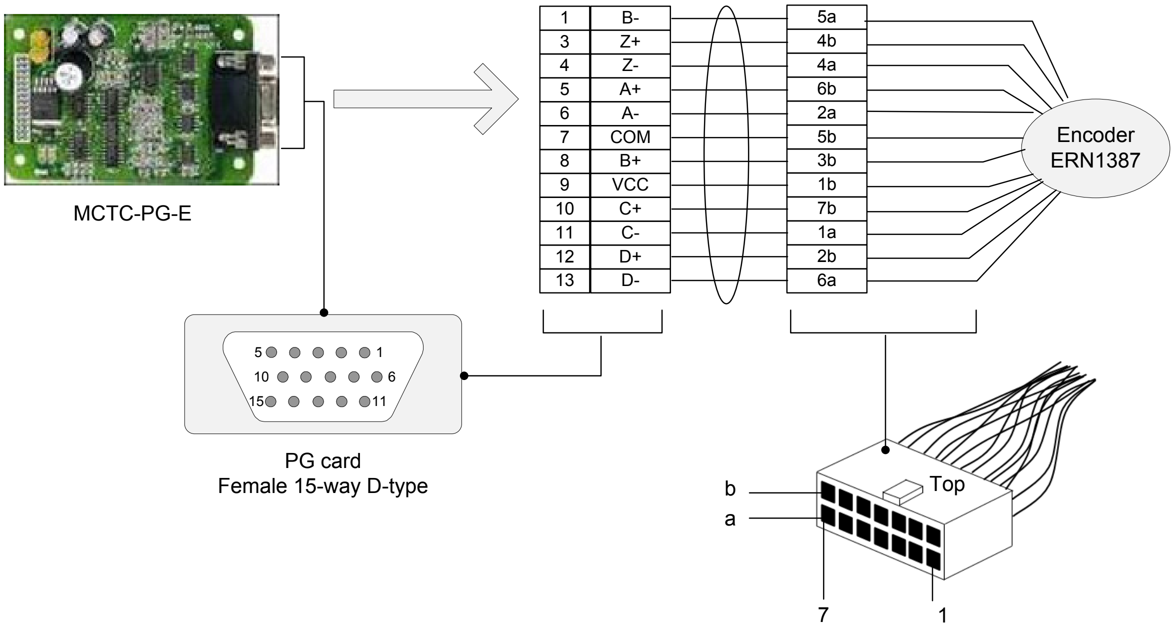
The MCTC-PG card is connected to the controller and the encoder as follows:

The J1 terminal and CN1 terminal of the MCTC-PG card are respectively connected to the J12 terminal of the MCB on the controller and the encoder of the motor.

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 connections between MCTC-PG-E and the controller.

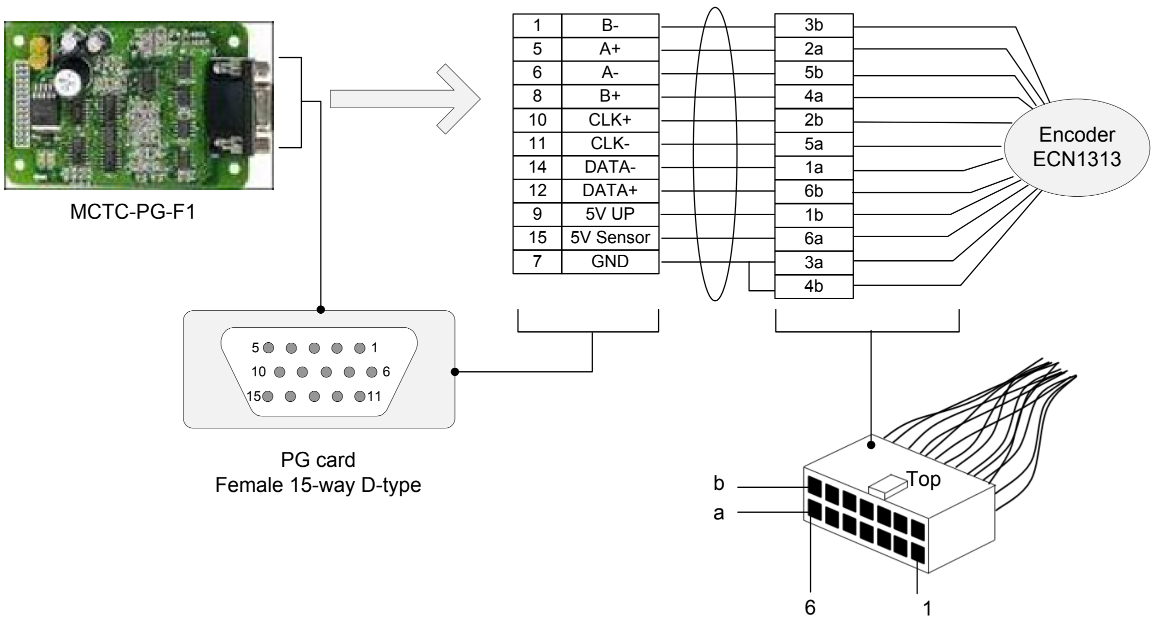
Figure 4-26 Connection between MCTC-PG-E and encoder ERN1387



Terminal definition of ERN1387 is described in the following table.

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

Figure 4-27 Connection between MCTC-PG-F1 and encoder ERN1313



Terminal definition of ERN1313 is described in the following table.

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

4.5.3 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.

5

Use of the Commissioning Tools

Chapter 5 Use of the Commissioning Tools

The NICE3000new supports five commissioning tools, as listed in the following table.

Tool	Function Description	Remark
Onboard 3-button 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 and download controller parameters.	Optional
Host computer monitoring software (NEMS)	It is used to monitor the current elevator state, view and modify all parameters, and upload and download parameters on the PC.	Optional. Download the software at www.szmctc.com.
Andriod cell phone commissioning software (EDSAP)	A Bluetooth module is used to connect the MCB and the Android cell phone installed with the commissioning software, through which you can commission the elevator, and upload and download parameters.	The software does not provide the English version currently.

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

5.1 Use of the Onboard Keypad

5.1.1 Buttons and Display

The onboard keypad consists of three 7-segment LEDs and three buttons. You can view information about the controller and enter simple commands on the keypad.

CAUTION

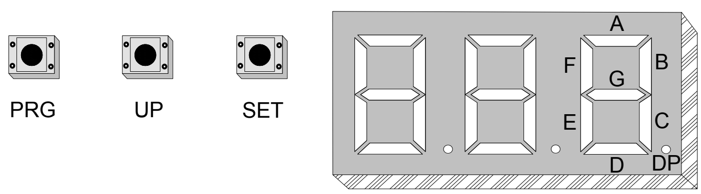
The keypad is exposed, and pay attentions to the following points during use:

1. Wear insulated gloves when performing operations on the keypad to prevent electric shock or damage to the controller components due to electrostatic discharge.

2. Do not use a metal or sharp tool to press the button to prevent the short circuit fault or damage to the components on the MCB.

The following figure shows the appearance of the keypad.

Figure 5-1 Appearance of the keypad

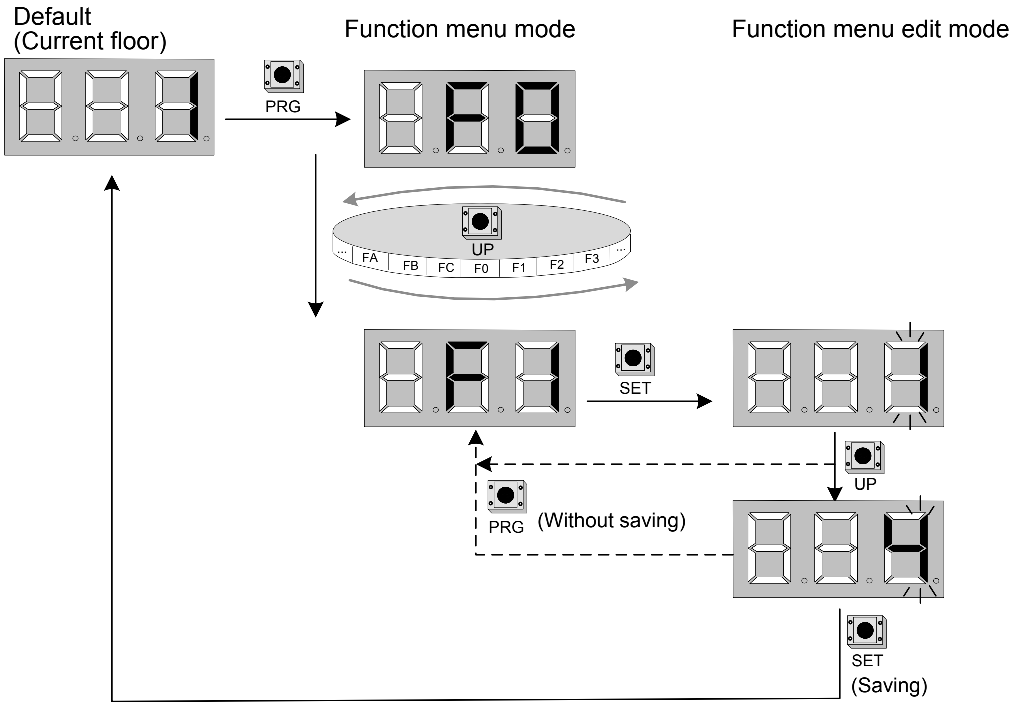


As shown in the preceding figure, the three buttons are PRG, UP, and SET. The functions of the three buttons are described in the following table.

Button	Function
PRG	Press this button in any state to exit the current operation and enter the function menu mode (that is, display the current function group number).
UP	Press this button to increase the function group number or data. In group F6 menu, this button is used as 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 as the door close command.

The following figure shows the setting of increasing the called floor to 5.

Figure 5-2 Setting the called floor



5.1.2 Menu Description

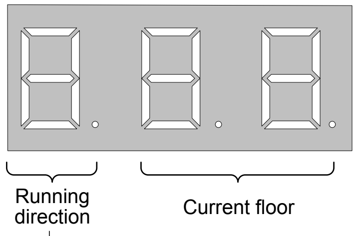
The function menus displayed on the keypad are described as follows:

- F0: display of floor and running direction

  The F0 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 7-segment LEDs automatically display the fault code and blink. If the fault is reset automatically, the F0 menu is displayed.



- F1: 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 F0 menu at the same time.

- F2: fault reset and fault code display

  After you enter the F2 menu, the 7-segment 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 F0 menu.

  Display "2": If you select this value and press the SET button, the 7-segment LEDs display the 11 fault codes and occurrence time circularly. You can press the PRG button to exit.

- F3: time display

  After you enter the F3 menu, the 7-segment LEDs display the current system time circularly.

- F4: contract number display

  After you enter the F4 menu, the 7-segment LEDs display the user’s contract number.

- F5: running times display

  After you enter the F5 menu, the 7-segment LEDs display the elevator running times circularly.

- F6: door open/close control

  After you enter the F6 menu, the 7-segment 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.

- F7: shaft auto-tuning command input

  After you enter the F7 menu, the 7-segment LEDs display "0". You can select 0 or 1 here, where "1" indicates the shaft auto-tuning command available.

  After you select "1" and press the SET button, shaft auto-tuning is implemented if the conditions are met. Meanwhile, the display switches over to the F0 menu. After shaft auto-tuning is complete, F7 is back to "0" automatically. If shaft auto-tuning conditions are not met, fault code "E35" is displayed.

- F8: test function

  After you enter the F8 menu, the 7-segment LEDs display "0". The setting of F8 is described as follows:

  • 1: Hall call forbidden

  • 2: Door open forbidden

  • 3: Overload forbidden

  • 4: Limit switches disabled

  • 6: Entering slip experiment state

  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.

- F9: reserved

- FA: auto-tuning

  After you enter the FA menu, the 7-segment LEDs display "0". The setting range of FA 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 7-segment LEDs display "TUNE", and the elevator enters the auto-tuning state.

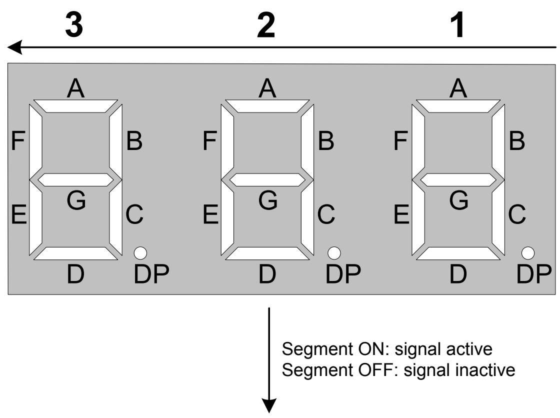
  After confirming that the elevator meets the safe running conditions, press the SET button again to start auto-tuning.

  After auto-tuning is complete, the 7-segment LEDs display the present angle for 2s, and then switch over to the F0 menu.

  You can press the PRG button to exit the auto-tuning state.

- Fb: CTB state display

  After you enter the Fb menu, the 7-segment LEDs display the input/output state of the CTB. The following figure shows the meaning of each segment of the LEDs.



	1	2	3
A	Light curtain 1 input	Light-load	Door open 1 output
B	Light curtain 2 input	-	Door close 1 output
C	Door open limit 1 input	-	Forced door close 1 output
D	Door open limit 2 input	-	Door open 2 output
E	Door close limit 1 input	-	Door close 2 output
F	Door close limit 2 input	-	Forced door close 2 output
G	Full-load input	-	Up arrival gong output
DP	Overload input	-	Down arrival gong output

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

  0: Direction unchanged

  1: Direction reversed

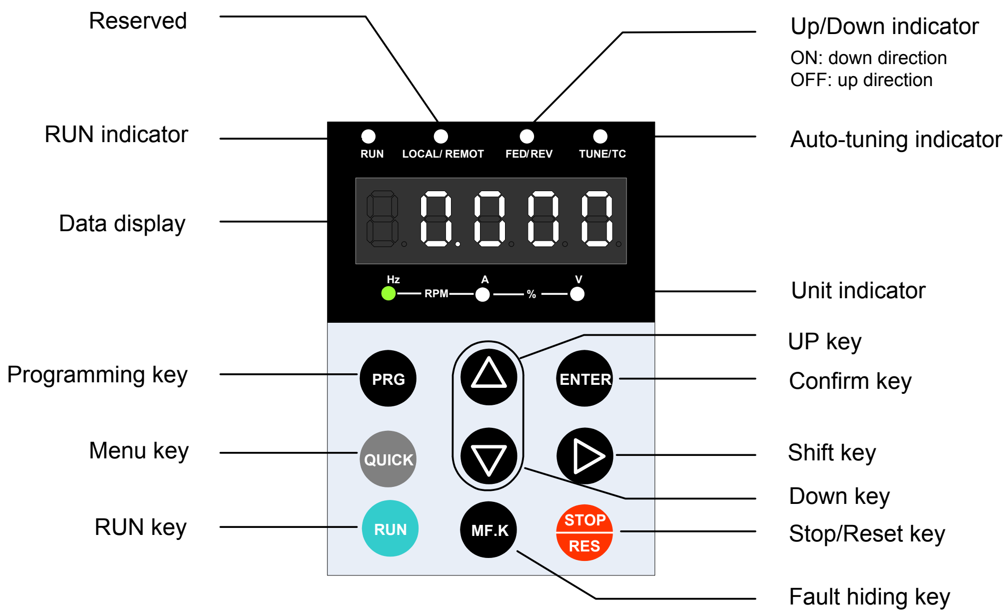
5

5.2 Use of the LED Operation Panel (MDKE)

5.2.1 Introduction to the Operation Panel

The LED operation panel is connected to the RJ45 interface of the controller by using an 8-core flat cable. You can modify the parameters, monitor the working status and start or stop the controller by operating the operation panel. The following figure shows the LED operation panel.

Figure 5-3 LED operation panel diagram



◆ Status Indicators

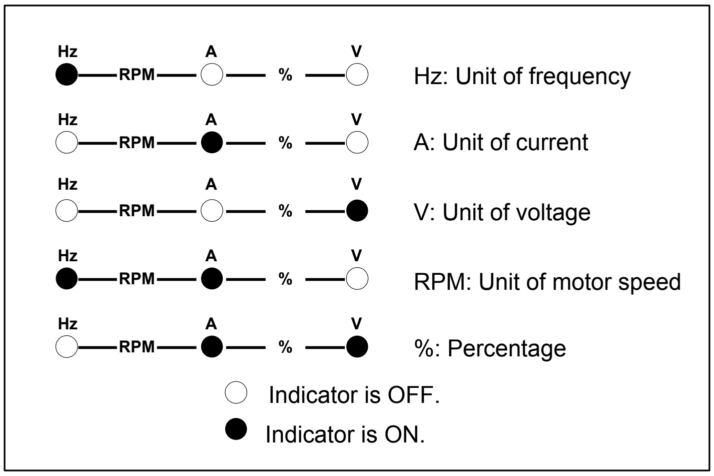
There are four red LED status indicators at the top of the operating panel.

Indicator	Indication
RUN	OFF indicates the controller is in the stop state.
	ON indicates the controller is in the running state.
LOCAL/REMOT	Reserved
FWD/REV	OFF indicates elevator in up direction.
	ON indicates elevator in down direction.
TUNE/TC	ON indicates in auto-tuning state.

◆ Unit Indicators

There are three red unit indicators below the data display area. These indicators operate individually or in pairs to show the units used to display data, as shown in the following figure.

Figure 5-4 Unit indicator explanation



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◆ LED Display

The five-digit LED data display can show the following range of information:

- Parameter value
- Monitoring information
- Fault code

The following table lists the LED display and actual data.

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

◆ Descriptions of Keys

Key	Name	Function
PRG	Programming	● Enter or exit the Level I menu. ● Return to the previous menu.
ENTER	Enter	● Enter the menu interfaces level by level. ● Confirm the parameter setting.
△	Up	● When navigating a menu, it moves the selection up through the screens available. ● When editing a parameter value, it increases the displayed value.
▽	Down	● When navigating a menu, it moves the selection down through the screens available. ● When editing a parameter value, it decreases the displayed value.
▷	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. Note: It is inactive when the controller is in distance control mode.
STOP RES	Stop/Reset	● Stop the controller when it is in the RUN state. ● Perform a reset operation when the AC drive 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.

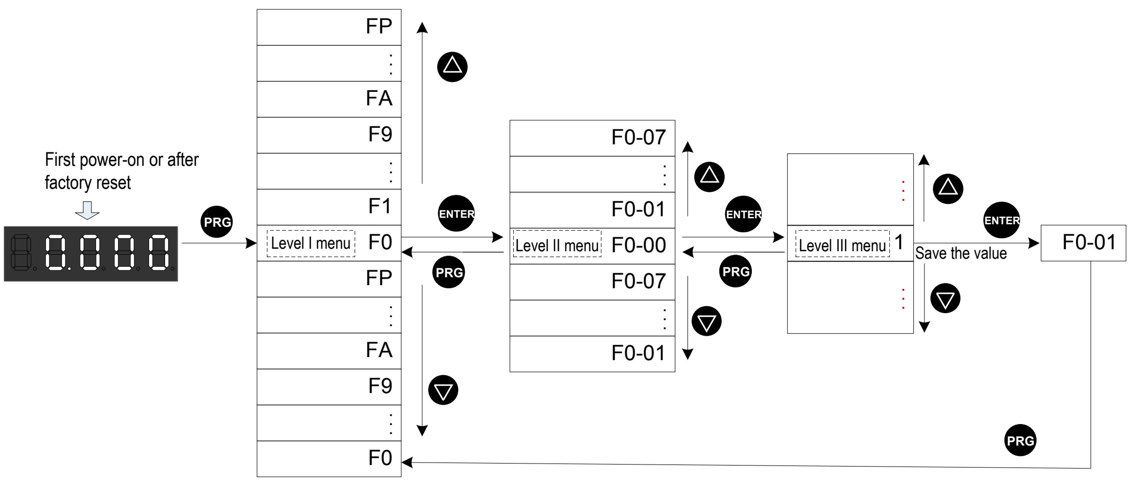
5

5.2.2 Overall Arrangement of Function Codes

The NICE3000new operating panel has three levels of menu:

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

Figure 5-5 Three-level menu structure



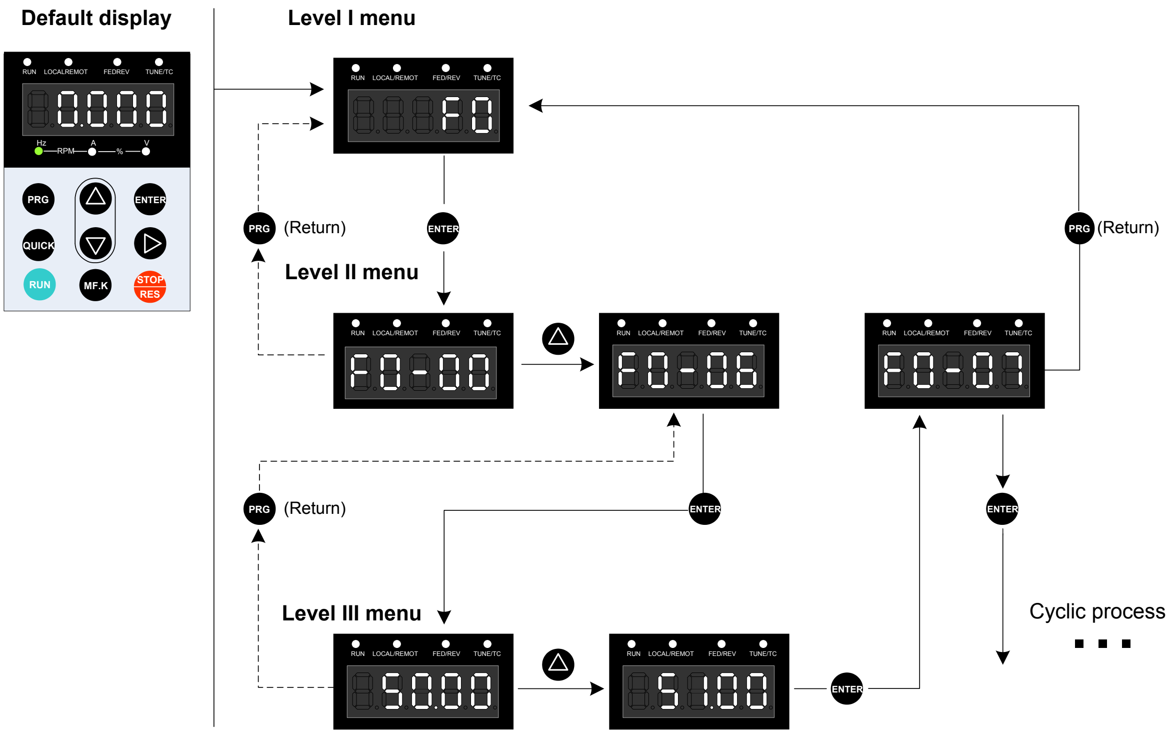
5.2.3 Function Code Operations

◆ Viewing and Modifying

1. Basic viewing and modifying procedure

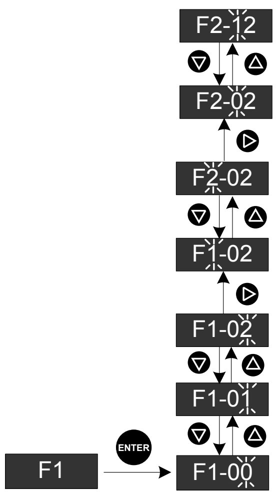
The following figure shows the basic operation procedure of the LED operation panel.

Figure 5-6 Basic viewing and modifying procedure



Press to switch the blinking digit.

For example, to switch from F2-12 to F1-00, perform operations according to the following figure.



Press ENTER from a Level III menu to:

- Save the parameter value you have set;
- Return to the Level II menu, and then
- switch to the next function parameter.

Press PRG from a Level III menu to:

Return to the Level II menu without saving the parameter value, and remain at the current function code.

Unchangeable Parameters

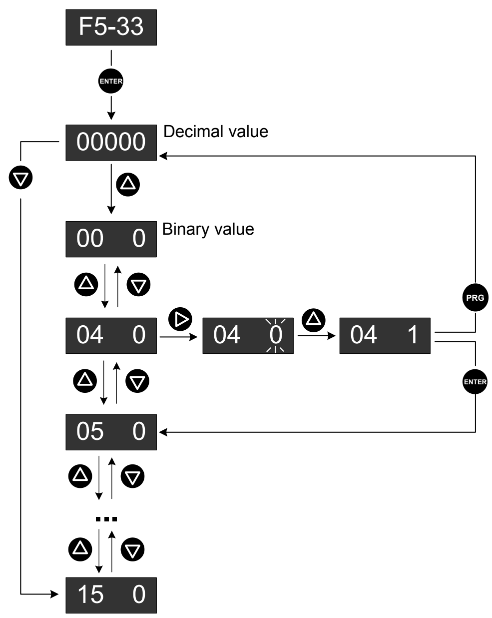
When operating in Level III menus, if the parameter does not include a blinking digit, then it is not allowed to change that parameter. There are two possible reasons for this:

1) The function parameter you have selected is read-only. This is because:

- The display is showing the controller model.
- The display is showing an actual parameter detected by the system.
- The display is showing a running record parameter.

2) The displayed function parameter cannot be changed while the controller is in the RUN state. You can change these types of parameter only when the controller is in the stop state.

2. Viewing and modifying function codes in bit



3. Viewing modified parameters

Function Code	Parameter Name	Setting Range
FP-02	User-defined parameter display	0: Invalid (Default)
		1: Valid

You can view the user-modified parameters.

Set FP-02 to 1, and the operation panel displays only the parameters that are different from the default setting.

If you want the operation panel to display all parameters, restore FP-02 to the default value 0.

◆ Saving and Restoring

After you change the value of any function parameter and press ENTER to save the setting, the NICE3000new stores the changed value locally so that the change remains effective when you power on the controller next time. The NICE3000new also stores alarm information and cumulative running time statistics.

You can also restore the default parameter settings, or clear the running data by using the function parameter FP-01.

Function Code	Parameter Name	Setting Range
FP-01	Parameter update	0: No operation
		1: Restore default settings (except group F1)
		2: Clear fault records

If you set this parameter to 1 (Restore default settings), all parameters except group F1 are restored to the default settings. Be cautions with this setting.

◆ Password Security

The NICE3000new controller provides a security protection function that requires a user-defined password. Function parameter FP-00 implements this function.

To enable the password protection, do as follows:

- Set a non-zero value for FP-00. This value is the user-defined password.
- Make a written note of the value you have set for FP-00 and keep the note in a safe location. Remember the password that you set. If the password is forgotten, contact us to replace the control board.
- Press ENTER to save the setting and exit the function parameter editing mode.

The password protection is successfully enabled. Then when you press PRG , the display shows "-----". You must enter the correct password to enter the programming menu.

To cancel password protection, do as follows:

- Use the current password to enter the function parameter editing mode.
- Set FP-00 to zero.
- Press ENTER to save the setting and exit the function parameter editing mode.

5

6

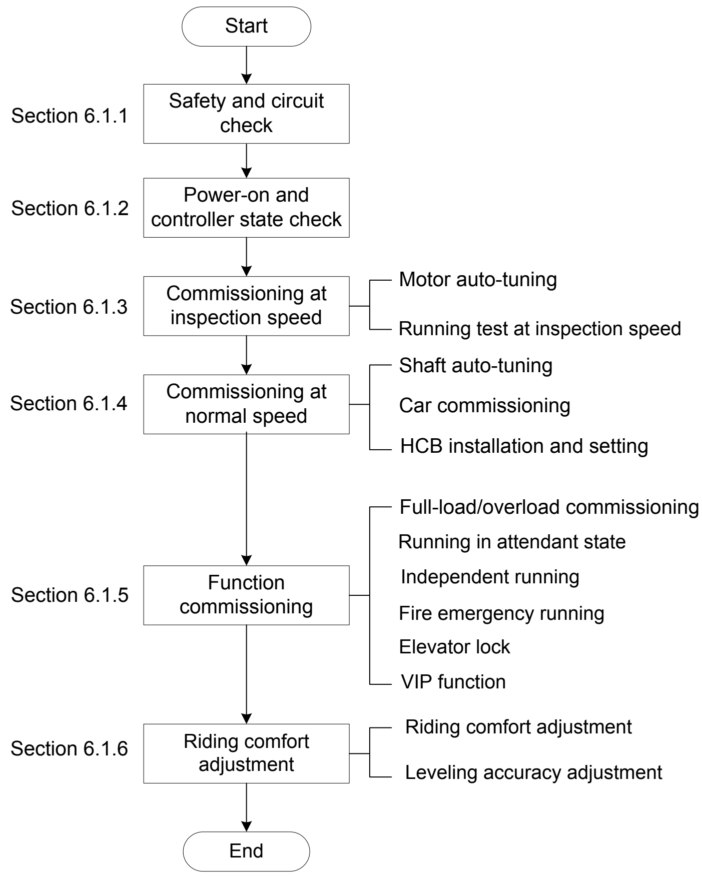
System Commissioning and Functions

Chapter 6 System Commissioning and Functions

6.1 System Commissioning Guide

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.

Figure 6-1 Overall commissioning flowchart of the NICE3000^{new}



6.1.1 Safety and Circuit Check

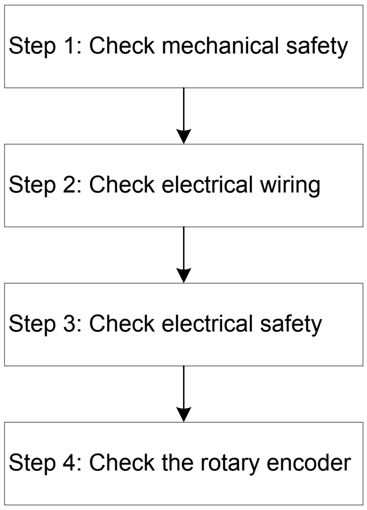
1. System wiring diagram

Refer to Figure 3-11 in section 3.2.1.

NOTE	The input and output terminals of the NICE3000^{new} has 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.

2. Safety check flowchart

Figure 6-2 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.

- The power supply R, S, T cables are wired correctly and securely.
- The UVW cables between the controller and the motor are wired correctly and securely.
- The controller (cabinet) and motor are grounded correctly.
- The safety circuit is conducted, and the emergency stop buttons and switches in the cabinet and in the equipment room can be enabled.
- The door lock circuit is conducted. The door lock circuit is disconnected when the car door or any hall door opens.

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.

- The line voltage of the user power supply is within 380–440 VAC, and the phase unbalance degree does not exceed 3%.
- The total lead-in wire gauge and total switch capacity meet the requirements.
- There is no inter-phase or to-ground short circuit in the R, S, T power supply.

- There is no inter-phase or to-ground short circuit in the U, V, W phases of the controller. There is no inter-phase or to-ground short circuit in the U, V, W phases of the motor.
- There is no short circuit to ground short circuit on the output side of the transformer.
- There is no inter-phase or to-ground short circuit in the 220 V power supply.
- The 24 V power supply has no short circuit between positive and negative or to-ground short circuit.
- 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.

- The encoder is installed reliably with correct wiring.
- The encoder signal cables and strong-current circuit are laid in different ducts to prevent interference.
- 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.
- The shield of the encoder cables is grounded on the end connected to the controller (only one end is grounded to prevent interference).

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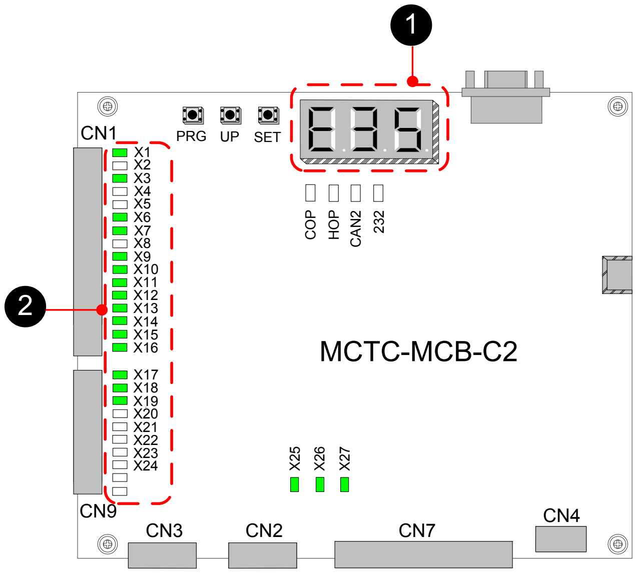
6.1.2 Power-on and Controller State Check

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 24V 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.
3. Check that the controller is powered on properly.

Figure 6-3 MCB display after normal power-on



Note 1: There is display on the keypad.
Note 2: Certain inputs on the MCB are active.

a: 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.

b: 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.

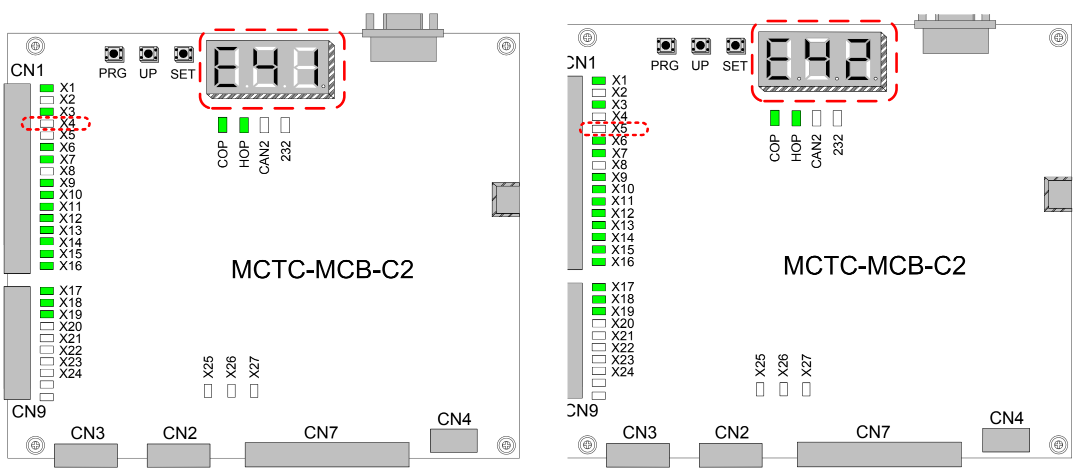
4. Check the controller state and handle related faults accordingly as follows:

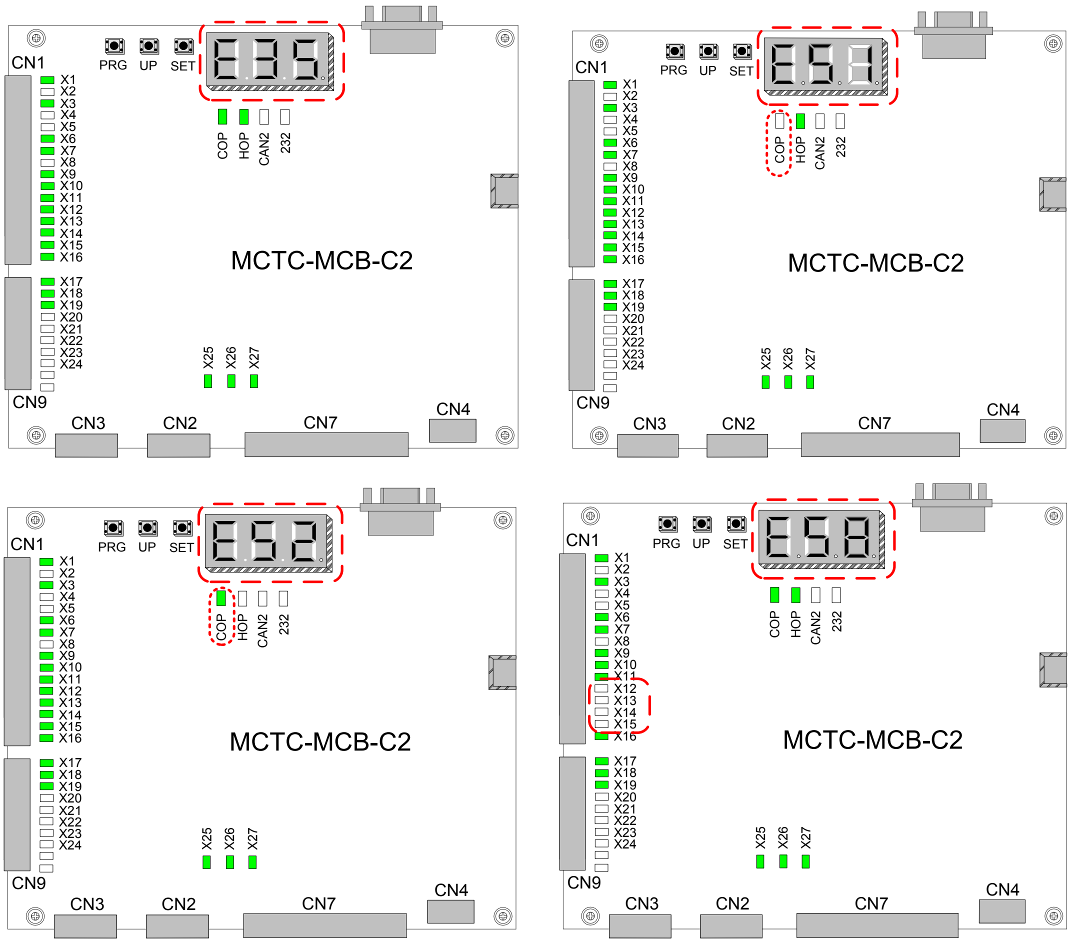
During commissioning especially at first-time power-on, certain faults may occur because the conditions for automatic elevator running are not met and certain peripheral signals are not connected.

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

Figure 6-4 MCB state at faults during commissioning





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

Table 6-1 Fault handling before commissioning at inspection speed

Fault Code	Fault Name	Fault Description	Handling Method
E41	Safety circuit fault	1. At this fault, the elevator cannot run or be commissioned. 2. By default, the safety circuit signal is connected to terminal X4.	Observe whether the signal indicator of input terminal X4 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.
E42	Door lock circuit fault	1. At this fault, the elevator cannot run or be commissioned. 2. By default, the door lock circuit signal is connected to terminal X5.	Observe whether the signal indicator of terminal X5 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.
	Shaft auto-tuning data abnormal	This fault is reported at each power-on because shaft auto-tuning is not performed. It does not affect commissioning at inspection speed.	Press MF.K on the operation panel to hide the fault display. Then, you can perform inspection at inspection speed.
E35	CAN communication fault	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.	

Fault Code	Fault Name	Fault Description	Handling Method
E52	HCB communication fault	1. This fault does not affect motor auto-tuning and commissioning at inspection speed. 2. The HOP indicator is OFF at this fault.	Press MF.K on the operation panel to hide the fault display. Then, you can perform inspection at inspection speed.
E58	Position switches abnormal	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.	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.

6.1.3 Commissioning at Inspection Speed

§ Safety Precautions

Ensure that all installation and wiring comply with the electrical safety specifications before commissioning at inspection speed.

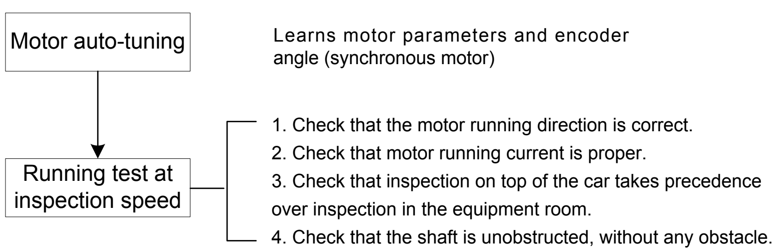
During auto-tuning involving car, pay attention to the running direction of the motor and prevent the elevator from getting too close to the terminal floor. You are advised to run the car to the floor far away (for example, more than 2 floors away) from the terminal floor, and then perform commissioning.

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

- 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.



◆ Motor Auto-tuning

1. Parameters related to motor auto-tuning

Function Code	Parameter Name	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: ECN413/1313 absolute encoder
F1-12	Encoder pulses per revolution	0–10000
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
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

2. Motor auto-tuning flowcharts

■ Synchronous motor auto-tuning

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

START	Func. Code	Parameter Name	Default	Commissioning
↓				
Enter inspection state		Turn the Automatic/Inspection switch to the Inspection position. X9 indicator is OFF, indicating that the elevator enters inspection state.		
↓				
Select command source	F0-01	Command source selection	1	1
↓		0: Operation panel control 1: Distance control		
Set motor type	F1-25	Motor type	1	1
↓		0: Asynchronous motor 1: Synchronous motor		

6

Continue	Func. Code	Parameter Name	Default	Commissioning
Set motor parameters		Motor Nameplate		
		Be sure that motor parameters are set correctly. Otherwise, faults will occur.		
	F1-01	Rated motor power	Model dependent	
		Unit: kW		
	F1-02	Rated motor voltage	Model dependent	
		Unit: V		
	F1-03	Rated motor current	Model dependent	
		Unit: A		
	F1-04	Rated motor frequency	Model dependent	
		Unit: Hz		
	F1-05	Rated motor speed	Model dependent	
		Unit: RPM		
Set encoder parameters	F1-00	Encoder type	0	
		0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: ECN413/1313 absolute encoder Set F1-00 according to the actual encoder type.		
	F1-12	Encoder pulses per revolution	2048	
		Set this parameter according to the encoder nameplate.		
Set auto-tuning mode	F1-11	Auto-tuning mode	0	1
		0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning After setting F1-11 to 1, press ENTER on the operation panel. If the operation panel displays "TUNE", the system enters motor auto-tuning state. If the operation panel displays "F1-12", the system fails to enter motor auto-tuning state. You need to check: 1. Whether the elevator is inspection state. 2. Whether the MCB displays faults to be rectified 3. Whether F0-01 is set to 1		
Perform auto-tuning		Hold down the inspection UP/DOWN button during auto-tuning. After auto-tuning is completed, the controller automatically stops output, and then you can release the button.		
Auto-tuning completed		1. After auto-tuning is completed, the keypad on the MCB displays the learnt encoder angle for 3s. 2. Ensure that the value deviation of F1-06 is within ±5° through multiple times of auto-tuning.		

6

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

START	Func. Code	Parameter Name	Default	Commissioning
↓				
Enter inspection state		Turn the Automatic/Inspection switch to the Inspection position. X9 indicator is OFF, indicating that the elevator enters inspection state.		
Select command source	F0-01	Command source selection	1	0
↓		0: Operation panel control 1: Distance control		
Set motor type	F1-25	Motor type	1	1
↓		0: Asynchronous motor 1: Synchronous motor		
Set motor parameters		Motor Nameplate		
↓		Be sure that motor parameters are set correctly. Otherwise, faults will occur.		
	F1-01	Rated motor power	Model dependent	
		Unit: kW		
	F1-02	Rated motor voltage	Model dependent	
		Unit: V		
	F1-03	Rated motor current	Model dependent	
		Unit: A		
	F1-04	Rated motor frequency	Model dependent	
		Unit: Hz		
	F1-05	Rated motor speed	Model dependent	
		Unit: RPM		
Set encoder parameters	F1-00	Encoder type	0	
↓		0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: ECN413/1313 absolute encoder Set F1-00 according to the actual encoder type.		
	F1-12	Encoder pulses per revolution	2048	
		Set this parameter according to the encoder nameplate.		

6

Continue	Func. Code	Parameter Name	Default	Commissioning
Set auto-tuning mode	F1-11	Auto-tuning mode	0	2
		0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning After setting F1-11 to 2, press ENTER on the operation panel. If the operation panel displays "TUNE", the system enters motor auto-tuning state. If the operation panel displays "F1-12", the system fails to enter motor auto-tuning state. You need to check: 1. Whether the elevator is inspection state. 2. Whether the MCB displays faults to be rectified 3. Whether F0-01 is set to 0		
Perform auto-tuning		1. Release the brake manually. 2. Press RUN on the operation panel to start auto-tuning. After auto-tuning is completed, the controller stops output automatically.		
Auto-tuning completed		1. After auto-tuning is completed, the keypad on the MCB displays the learnt encoder angle for 3s. 2. Ensure that the value deviation of F1-06 is within ±5° through multiple times of auto-tuning.		
Restore F0-01 to 1	F0-01	Command source selection	1	1
		After auto-tuning is completed, F0-01 must be restored to 1. Otherwise, the elevator cannot run.		

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

a. Synchronous motor auto-tuning learns encoder initial angle, motor wiring mode, stator resistance, shaft-D and shaft-Q inductance, and motor back EMF.

b. 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°.

c. Each time the encoder, encoder cable connection or motor wiring sequence is changed, perform motor auto-tuning again.

d. You can modify F1-06 manually. The modification, however, takes effect only after power-on again. Therefore, after you replace the MCB, you can directly set F1-06 to the original value rather than performing motor auto-tuning; then, the controller can start to run after power-off and power on again.

■ Asynchronous motor auto-tuning

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

START	Func. Code	Parameter Name	Default	Commissioning
Enter inspection state		Turn the Automatic/Inspection switch to the Inspection position. X9 indicator is OFF, indicating that the elevator enters inspection state.		
Select command source	F0-01	Command source selection	1	0
		0: Operation panel control 1: Distance control		
Set motor type	F1-25	Motor type	1	0
		0: Asynchronous motor 1: Synchronous motor		
Set motor parameters		Motor Nameplate		
		Be sure that motor parameters are set correctly. Otherwise, faults will occur.		
	F1-01	Rated motor power	Model dependent	
		Unit: kW		
	F1-02	Rated motor voltage	Model dependent	
		Unit: V		
	F1-03	Rated motor current	Model dependent	
		Unit: A		
	F1-04	Rated motor frequency	Model dependent	
		Unit: Hz		
	F1-05	Rated motor speed	Model dependent	
		Unit: RPM		
Set encoder parameters	F1-00	Encoder type	0	
		0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: ECN413/1313 absolute encoder Set F1-00 according to the actual encoder type.		
	F1-12	Encoder pulses per revolution	2048	
		Set this parameter according to the encoder nameplate.		

Continue	Func. Code	Parameter Name	Default	Commissioning
Set auto-tuning mode	F1-11	Auto-tuning mode	0	1
↓		0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning After setting F1-11 to 1, press ENTER on the operation panel. If the operation panel displays "TUNE", the system enters motor auto-tuning state. If the operation panel displays "F1-12", the system fails to enter motor auto-tuning state. You need to check: 1. Whether the elevator is inspection state. 2. Whether the MCB displays faults to be rectified 3. Whether F0-01 is set to 0		
Perform auto-tuning		Press RUN on the operation panel to start auto-tuning. 1. During with-load auto-tuning, the motor does not rotate, but there is current noise. The auto-tuning process lasts about several tens of seconds. 2. After auto-tuning is completed, the controller stops output automatically. 3. Five parameters F1-14 to F1-18 are obtained.		
Auto-tuning completed				
↓				
Restore F0-01 to 1	F0-01	Command source selection	1	1
		After auto-tuning is completed, F0-01 must be restored to 1. Otherwise, the elevator cannot run.		

b. Asynchronous motor no-load auto-tuning

START	Func. Code	Parameter Name	Default	Commissioning
↓				
Enter inspection state		Turn the Automatic/Inspection switch to the Inspection position. X9 indicator is OFF, indicating that the elevator enters inspection state.		
Select command source	F0-01	Command source selection	1	0
↓		0: Operation panel control 1: Distance control		
Set motor type	F1-25	Motor type	1	0
↓		0: Asynchronous motor 1: Synchronous motor		

Continue	Func. Code	Parameter Name	Default	Commissioning
Set motor parameters		Motor Nameplate		
		Be sure that motor parameters are set correctly. Otherwise, faults will occur.		
	F1-01	Rated motor power	Model dependent	
		Unit: kW		
	F1-02	Rated motor voltage	Model dependent	
		Unit: V		
	F1-03	Rated motor current	Model dependent	
		Unit: A		
	F1-04	Rated motor frequency	Model dependent	
		Unit: Hz		
	F1-05	Rated motor speed	Model dependent	
		Unit: RPM		
Set encoder parameters	F1-00	Encoder type	0	
		0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: ECN413/1313 absolute encoder Set F1-00 according to the actual encoder type.		
	F1-12	Encoder pulses per revolution	2048	
		Set this parameter according to the encoder nameplate.		
Set auto-tuning mode	F1-11	Auto-tuning mode	0	2
		0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning After setting F1-11 to 2, press ENTER on the operation panel. If the operation panel displays "TUNE", the system enters motor auto-tuning state. If the operation panel displays "F1-12", the system fails to enter motor auto-tuning state. You need to check: 1. Whether the elevator is inspection state. 2. Whether the MCB displays faults to be rectified 3. Whether F0-01 is set to 0		
Perform auto-tuning		1. Release the brake manually. 2. Press RUN on the operation panel to start auto-tuning. After auto-tuning is completed, the controller stops output automatically.		
Auto-tuning completed				

6

Continue
Restore F0-01 to 1

Func. Code	Parameter Name	Default	Commissioning
F0-01	Command source selection	1	1
	After auto-tuning is completed, F0-01 must be restored to 1. Otherwise, the elevator cannot run.		

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 E38 is reported. To solve the problem, exchange phases A and B of the encoder.

■ Output State of RUN and Brake Contactors and Motor State

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 6-2 Output state of RUN and brake contactors and motor state

Auto-tuning mode / Motor State / Control Object	No-load auto-tuning		With-load auto-tuning	
	Synchronous motor	Asynchronous motor	Synchronous motor	Asynchronous motor
RUN contactor	Working	Working	Working	Working
Brake contactor	Not working	Not working	Working	Not working
Motor	Rotate	Rotate	Rotate	Not rotate

3. Possible faults and handling

- Auto-tuning fails, and fault E19 is reported.

  Check whether the encoder cables are broken; replace a new PG card and perform auto-tuning again.

- Auto-tuning fails, and fault E20 is reported.

  a. Check whether the brake is released completely. If not, check whether power supply of the brake and power circuit are normal.

  b. Check whether the encoder cables are broken.

  c. Check whether there is interference on the encoder cables by observing whether the encoder cables are too close to the motor power cables.

  d. Check whether the encoder is in good condition and installed securely.

  e. 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.

- The motor wiring sequence is incorrect, and E20 and E33 may be reported.

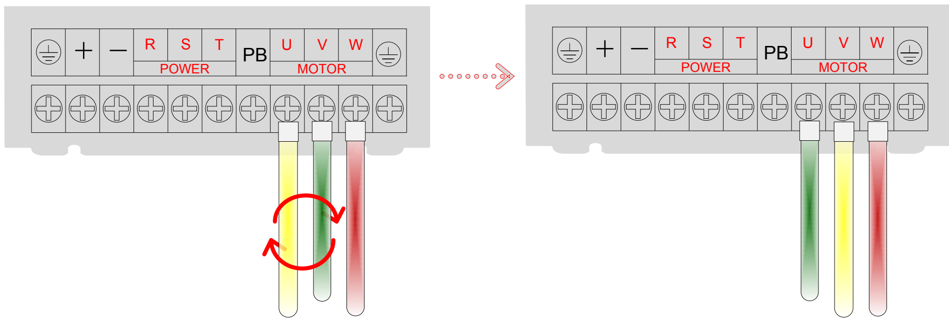
  a. During no-load auto-tuning, if the motor wiring sequence is incorrect, E20 (FC-60) with fault subcode 3 (FC-61) will be reported.

  b. During with-load auto-tuning, if the motor wiring sequence is incorrect, the synchronous motor will jitter abnormally during auto-tuning, E33 is reported, and auto-tuning stops.

For the asynchronous motor, there is no prompt during auto-tuning, but E33 is reported during running at inspection speed.

To solve the problem, exchange any two of the motor cables (exchange only once). Then, perform auto-tuning again.

Figure 6-5 Exchange motor cables



◆ Running Test at Inspection Speed

Function Code	Parameter Name	Setting Range	Default
F2-10	Elevator running direction	0: Direction unchanged 1: Direction reversed	0
F3-11	Inspection speed	0.100–0.630 m/s	0.250 m/s

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 much smaller than the rated motor current, 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:

   a. Whether the brake is released completely

   b. Whether the elevator balance coefficient is normal

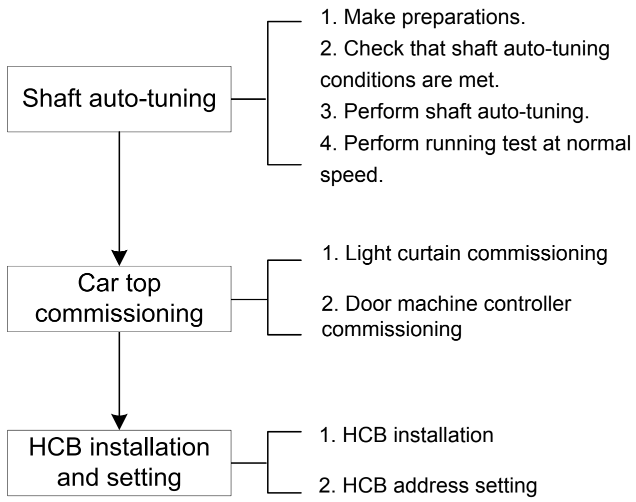
   c. Whether the car or counterweight guide shoes are too tense

3. 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 without any obstacles, so that the car will not be damaged.

5. 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.

6.1.4 Commissioning at Normal Speed



◆ Shat Auto-tuning

1. Make preparations for shaft auto-tuning.

- Check that the shaft switches act properly, including final limit switches, limit switches, slow-down switches, and leveling sensors.
- Check that the acting sequence of the leveling sensors is correct.

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

Acting sequence of sensors at inspection up: up leveling sensor → door zone sensor → down leveling sensor

Acting sequence of sensors at inspection down: down leveling sensor → door zone sensor → up leveling sensor

- Check CANbus communication state. If fault E51 is not reported and the COP 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 Chapter 9.
- Set the related parameters.

Function Code	Parameter Name	Setting Range	Default	Remarks
F0-04	Rated elevator speed	0.250–4.000 m/s	1.600 m/s	-
F6-00	Top floor of the elevator	F6-01 to 40	9	Set it to the actual number of floors (number of actually installed leveling plates).
F6-01	Bottom floor of the elevator	1 to F6-00	1	-

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

- The elevator is in the inspection state.
- The elevator is at the leveling position of the bottom floor.
- The down slow-down switch 1 signal input to the MCB is active.
- The NICE3000^new is not in the fault state. If there is a fault, press STOP/RES to reset the fault.

> NOTE
> When there are only two floors, the elevator needs to run to below the bottom leveling position, that is, at least one leveling sensor is below the leveling plate. This is the prerequisite for successful shaft auto-tuning.

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.
- Set F7 to 1 on the keypad of the MCB.

After shaft auto-tuning starts, the elevator runs at the inspection speed set in F3-11 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 E35 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 9, 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.

- Set F7-05 (Door open forbidden) to 1 (Yes).
- Set F7-06 (Overload function) to 1 (Enabled).
- Turn the inspection switch to the "Normal" state.
- Set F7-00 (Car call floor registered) to register a floor call and test the running at normal speed.

  The call set in F7-00 is the same as car call inside the elevator. Set F7-00 to any floor number, and run the elevator at normal speed; check whether the motor, elevator, and controller are abnormal during the running.

  It is recommended that you set F0-03 (Maximum running speed) to a small value for initial tests; after several times of tests are successful, set F0-03 to the required value.

- After the test is completed, restore all parameters in group F7 to 0.

> 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.

◆ Car Top Commissioning

Pay attentions to the following precautions before performing commissioning:

1. 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).
2. The MCTC-CTB is high level active by default.
3. This section takes the single-door 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, as described in the following table.

Table 6-3 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.

4. 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 6-6 Input/output state indicated by CTB signal indicators

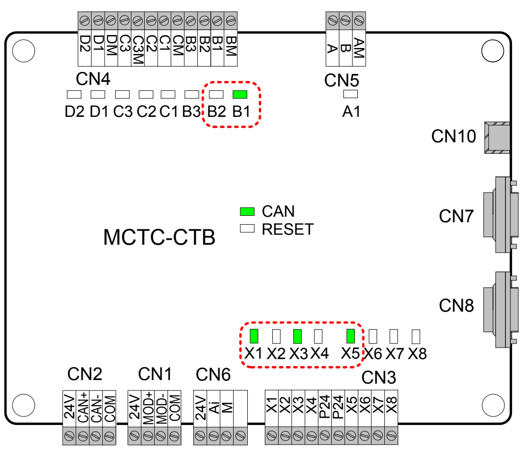
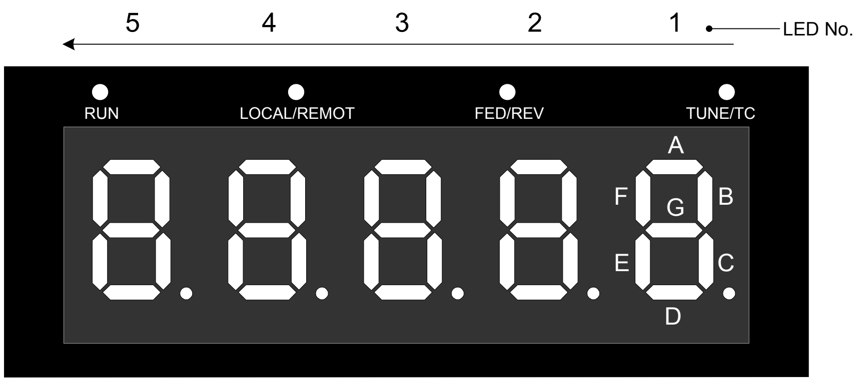


Table 6-4 Signal indicator state

Indicator	Status 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 operation panel to see whether the light curtain and door machine signals are active.

Figure 6-7 Monitoring of I/O terminals in F5-35



Note:
1. Segments of LEDs 2 to 5 are marked in the same way as those of LED1.
2. Segment ON indicates that the signal is active.

LED Segment		Indicated Signal
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

5. 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

■ Light Curtain Commissioning

The procedure of light curtain commissioning is as follows:

Step 1: Check whether the light curtain wiring is correct and secure and whether the power voltage is proper.

Step 2: Observe the ON/OFF state of the corresponding signal indicator on the CTB to check whether the light curtain works in normal state.

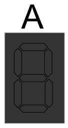
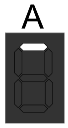
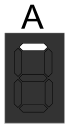
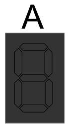
Table 6-5 Checking light curtain state based on X1 signal indicator

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

If the state of X1 signal indicator keeps unchanged or changes abnormally, it indicates that the light curtain is abnormal.

Step 3: 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 6-6 Checking consistency between F5-25 and actual light curtain

Signal	Light Curtain State Monitoring (Segment A of LED1 in F5-35)		Signal State Judging	Re-set F5-25 Bit0?
	Unblocked	Blocked		
Door 1 light curtain signal	A 	A 	Normal	Not required
	A 	A 	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.

■ Door Machine Controller Commissioning

The procedure of door machine controller commissioning is as follows:

Step 1: Check that F7-05 (Door open forbidden) is 0 (No).

Step 2: Check whether the door machine controller wiring is correct and secure and that the power voltage is proper.

Step 3: Commission the door machine controller, and check whether the input and output of the door machine controller are normal in terminal control mode.

1) 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:

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

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

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

2) 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 feedback from the door machine controller is normal, according to the following table.

Table 6-7 Judging door open/close limit

	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:

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

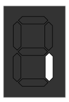
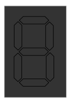
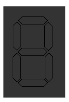
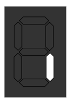
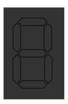
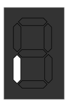
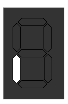
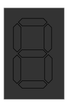
b. Whether the function setting of door open/close output terminals is correct

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

Step 4: 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 6-8 Checking consistency between F5-25 and actual door open/close limit signals

Signal	Signal State Monitoring		Signal State Judging	Re-set F5-25 Bit2/Bit4?
	At Door Open Limit	At Door Close Limit		
Door open limit signal (Segment C of LED1 in F5-35)	 C	 C	Normal	Not required
	 C	 C	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)	E 	E 	Normal	Not required
	E 	E 	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.

  a. Check whether the door open limit signal is always active.

  b. Check whether there is door open output by viewing segment A of LED 3 in F5-35. If there is output (segment A ON), check:

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

  Whether the door machine controller works properly.

- The door does not open after reaching the open limit position.

  a. Check whether the light curtain signal is always active.

  b. Check whether there is door close output by viewing segment B of LED 3 in F5-35. If there is output (segment B ON), check:

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

  Whether the door machine controller works properly.

- The elevator does not open the door in door zone area and fault E53 is reported. Rectify the fault according to the solution described in Chapter 9.

◆ HCB Installation and Setting

6

This section describes HCB installation and setting of the single-door independent elevator system. For details on HCB installation setting of parallel elevator system and opposite door elevator system, refer to sections 6.2.3 and 6.2.4.

1. HCB installation

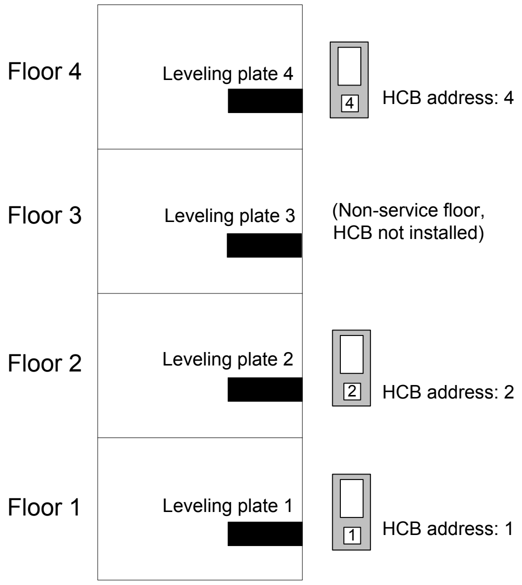
- Install an HCB for each service floor (non-service floors do not require the HCB), as shown in Figure 6-8.
- The HCB communicates with the MCB via Modbus. All HCBs are connected in parallel and then connected to the MCB.

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 in section 4.4.
- 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.

Figure 6-8 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.

6.1.5 Function Commissioning

◆ Full-Load/Overload Commissioning

6

WARNING

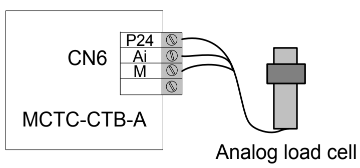
The full-load/overload switches must be commissioned correctly. If these switches are not commissioned or commissioned incorrectly, it will bring the following hazards:

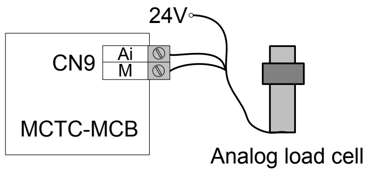
- When the car is overloaded, the overload signal is not sent to the control system and the motor may not run properly after startup, which endanger passengers in the car.
- If the car is seriously overloaded, the car may also fall due to slip between the steel rope and the traction sheave even if the motor does not start up. This will cause injury to passengers in the car.

The elevator full-load/overload switches are classified into two types: analog and digital. The following part separately describes the parameter setting and commissioning of the two types.

1. Commissioning of analog full-load/overload switches

■ Wiring and parameter setting of analog full-load/overload switches

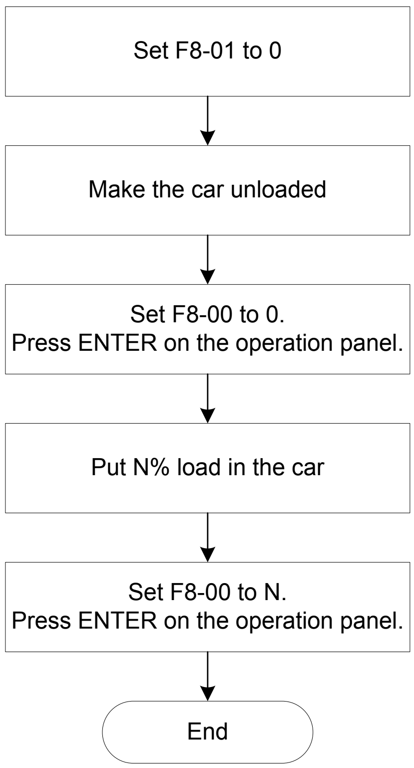
Type	Wiring Diagram	Parameter Setting
Connected to CTB	 Terminals P24 and M on the CTB are respectively connected to power cable positive and negative of the analog load cell, and terminal Ai are connected to the signal cable of the analog load cell.	F5-36 = 2 (CTB analog input)

Type	Wiring Diagram	Parameter Setting
Connected to MCB	 Terminal 24V 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 (MCB analog input)

■ Load cell auto-tuning

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 6-9 Analog load cell auto-tuning flowchart



The parameters involved in analog load cell auto-tuning are described in the following table.

Function Code	Parameter Name	Setting Range	Description
F8-00	Load for load cell auto-tuning	0–100	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	Set this parameter to 0 before starting analog load cell auto-tuning.

6

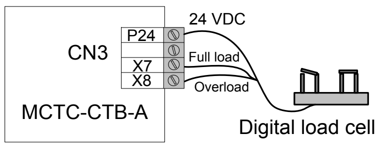
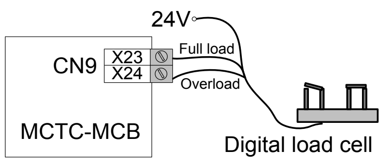
Function Code	Parameter Name	Setting Range	Description
F8-05	Current car load	0–1023	It displays the current load condition in the car.
F8-06	Car no-load load	0–1023	It records the obtained no-load condition.
F8-07	Car full-load load	0–1023	It records the obtained full-load condition.

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 value of F8-05 exceeds the value of F8-07, the system reports overload warning, forbids door close, and stops elevator running.

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.

2. Commissioning of digital full-load/overload switches

■ 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 (CTB digital input)
Connected to MCB	 This figure takes X23 and X24 inputs only as an example.	F5-36 = 0 (MCB digital input)

The parameters involved in commissioning of digital full-load/overload switches are described in the following table.

Function Code	Parameter Name	Setting Range	Value
F5-36	Load cell input selection	0: MCB digital input 1: CTB digital input 2: CTB analog input 3: MCB analog input	0
F5-23	X23 function selection	0–199	47 (Full-load signal, NC)
F5-24	X24 function selection	0–199	46 (Overload signal, NC)

NOTE

To guarantee running safety, the NC full-load/overload switches are recommended.

■ 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.

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Figure 6-10 Monitoring of full-load/overload signals in F5-35

◆ Attendant Running

The attendant function is described as follows:

- 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.
- Direct travel ride and direction change can be implemented by respectively using JP20 and JP22 on the CCB.
- 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.
- JP21 on the MCTC-CCB-A is used for attendant signal input.

Note that the preceding description is the default setting of the system, and certain actions can be modified by setting the parameters.

The parameter setting related to the attendant function is described in the following table.

Function Code	Parameter Name	Setting Range	Value
F6-43	Attendant function selection	Bit0: Calls cancelled 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: Continuous buzzer tweeting in attendant state Bit7: Car call button blinking to prompt	0
F5-00	F5-00	Attendant/Automatic switchover time	3
F6-41	Program control selection 2	Bit10: Elevator lock in the attendant state	0

For detailed descriptions of these parameters, refer to Chapter 8.

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◆ Independent Running

The independent running function is described as follows:

- The elevator responds to only car calls; it does not respond to hall calls, and the registered hall call is cleared automatically.
- 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.
- If the elevator is under parallel/group control, it exits the parallel/group control system after entering the independent running state.
- Set FE-32 Bit9 to 1, and perform independent running signal input via JP23 on the MCTC-CCB-A.

◆ Fire Emergency Running

The fire emergency function is described as follows:

- 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.

Note that the preceding description is the default setting of the system, and certain actions can be modified by setting the related parameters.

The firefighter function is described as follows:

- The elevator does not respond to hall calls. It responds to only the car call and only one car call can be registered.
- The elevator does not open or close the door automatically. You need to press the door open/close button (jog) to open/close the door.
- The light curtain signal input is inactive, and the safety edge signal input is active.

Note that the preceding description is the default setting of the system, and certain actions can be modified by setting the related parameters.

The input and output setting of fire emergency running and firefighter running is as follows:

1. Input setting:
   - Generally, 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 terminal Xa and Xb as an example) according to the following table.

- The NICE3000new supports switchover between two fire emergency floors, and the switchover signal is input via the MCB (take input terminal Xc as an example).

2. Output setting:

The fire emergency floor arrival signal is output via output terminal Y on the MCB (take Y3 as an example).

The parameter setting related to fire emergency running and firefighter running is described in the following table.

Function Code	Parameter Name	Value
F5-a	Xa function selection	11: NO fire emergency signal 43: NC fire emergency signal
F5-b	Xb function selection	23: NO firefighter running signal 55: NC firefighter running signal
F5-c	Xc function selection	72: NO fire emergency floor switchover signal 104: NC fire emergency floor switchover signal
F5-28	Y3 function selection	4: Fire emergency floor arrival signal

The other parameters related to fire emergency running and firefighter running are listed in the following table.

Function Code	Parameter Name	Setting Range	Default
F6-03	Fire emergency floor 1	F6-01 to F6-00	1
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 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
F8-12	Fire emergency floor 2	0 to F6-00	0

For detailed descriptions of these parameters, refer to Chapter 8.

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◆ Elevator Lock

The elevator lock function is described as follows:

- 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.

Note that the preceding description is the default setting of the system, and certain actions can be modified by setting the related parameters.

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 following table.

Function Code	Parameter Name	Value
F5-d	Xd function selection	28: NO elevator lock signal 60: NC elevator lock signal

The other parameters related to the elevator lock function are listed in the following table.

Function Code	Parameter Name	Setting Range	Default
F6-04	Elevator lock floor	F6-01 to F6-00	1
F6-38	Elevator lock start time	00.00–23.59	00.00
F6-39	Elevator lock end time	00.00–23.59	00.00
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

◆ VIP Function

The VIP function is described as follows:

- 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 car calls and hall calls, and does not respond to hall calls; door open or close needs to be controlled manually.
- The VIP running times is set in F6-46 Bit8 .

  F6-46 Bit8 = 1: The elevator responds to only one car call (the last one); after arriving at the floor required by the car call, the elevator automatically exits the VIP state.

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.

The following part describes how to set the VIP floor and use the VIP function.

1. Parameter setting

   Assume that it is a 20-floor elevator, and the 8th floor needs to be set as the VIP floor.

Function Code	Parameter 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	Parameter 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. The parameters to be set are described in the following table.

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Function Code	Parameter Name	Setting Range	Value	Remarks
Fd-07	HCB:JP1 input	0: Reserved NO/NC input: 1/33: Elevator lock signal 2/34: Fire emergency signal 3/35: Present floor forbidden 4/36: VIP floor signal 5/37: Security floor signal 6/38: Door close button input	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		4	
F6-46	VIP function selection	Bit1: VIP enabled by terminal	Bit1 = 1	After the hall call input for the VIP function is active, the elevator enters the VIP state.

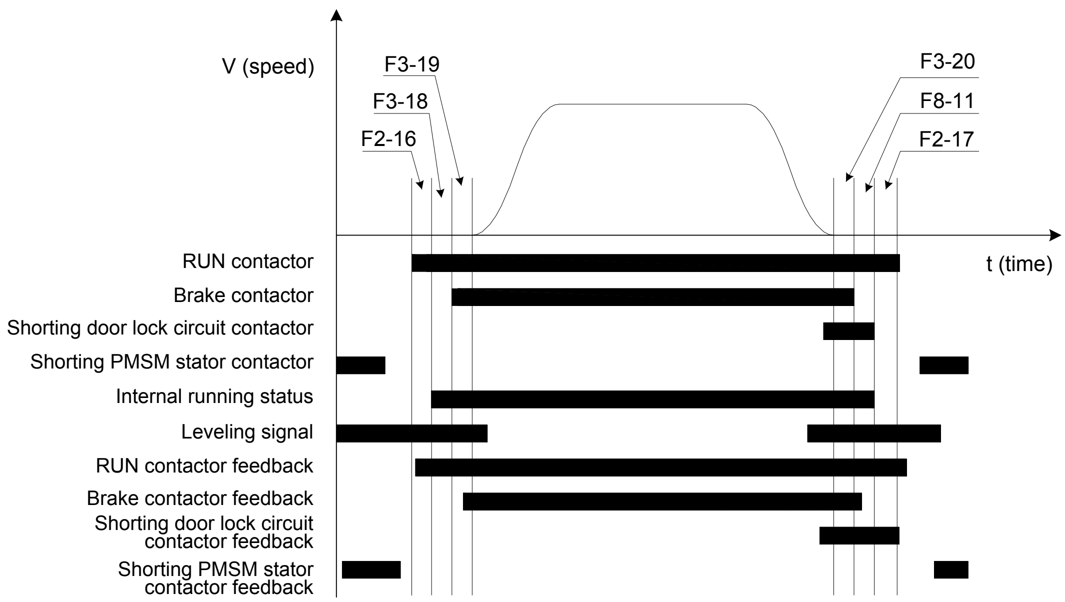
6.1.6 Riding Comfort Adjustment

◆ 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 system control and the elevator's mechanical construction.

1. Performance adjustment of system control

Figure 6-11 Running time sequence



■ Riding comfort adjustment at elevator startup and stop

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

Function Code	Parameter Name	Setting Range	Default
F2-00	Speed loop proportional gain Kp1	0–100	40

Function Code	Parameter Name	Setting Range	Default
F2-01	Speed loop integral time Ti1	0.01–10.00s	0.60s
F2-03	Speed loop proportional gain Kp2	0–100	35
F2-04	Speed loop integral time Ti2	0.01–10.00s	0.80s

1) 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.

a. 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.

a. 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 instable 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.

2) Adjustment to elevator startup

a. Adjustment for no-load-cell startup

The parameter setting related to riding comfort adjustment for no-load-cell startup is described in the following table.

Function Code	Parameter Name	Setting Range	Default	Remarks
F8-01	Pre-torque selection	0: Pre-torque invalid 1: Load cell pre-torque compensation 2: Automatic pre-torque compensation	0	The no-load-cell startup function is enabled when F8-01 is set to 2.
F2-11	Position lock current coefficient	0.20%–50.0%	15%	These are position lock parameters, and are valid only when F8-01 is 2.
F2-12	Position lock speed loop Kp	0.00–2.00	0.5	
F2-13	Position lock speed loop KI	0.00–2.00	0.6	

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 car lurch, 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.

b. Adjustment for load cell startup

The parameter setting related to riding comfort adjustment for load cell startup is described in the following table.

Function Code	Parameter Name	Setting Range	Default	Remarks
F8-01	Pre-torque selection	0: Pre-torque invalid 1: Load cell pre-torque compensation 2: Automatic pre-torque compensation	0	When a load cell is used, set F8-01 to 1.
F8-02	Pre-torque offset	0.0%–100.0%	50.0%	These are pre-torque regulating parameters.
F8-03	Drive gain	0.00–2.00	0.60	
F8-04	Brake gain	0.00–2.00	0.60	

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

3) 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	Parameter Name	Setting Range	Default
F3-19	Brake release delay	0.000–2.000s	0.600s

Function Code	Parameter Name	Setting Range	Default
F8-11	Brake apply delay	0.200–1.500s	0.200s

The system retains the zero-speed torque current output within the time set in F3-19 from the moment when the system sends the brake release command; this is to prevent rollback. 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.

4) Handling of current noise at motor startup and stop

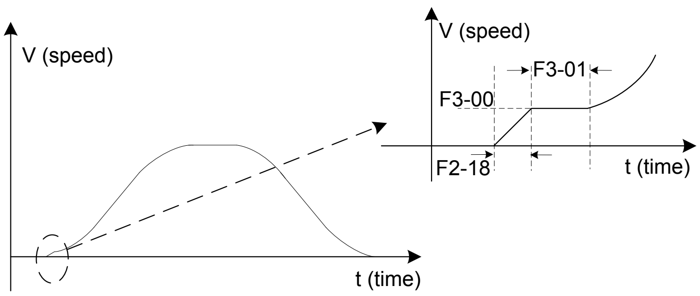
During elevator startup or stop, certain motors may generate noise when the current is applied before the brake is released or the current is removed after the brake is applied. To reduce motor noise, increase F2-16 or F2-17 properly.

Function Code	Parameter Name	Setting Range	Default
F2-16	Torque acceleration time	1–500 ms	1 ms
F2-17	Torque deceleration time	1–500 ms	350 ms

5) Adjustment at large mechanical static friction

Function Code	Parameter Name	Setting Range	Default
F2-18	Startup acceleration time	0.000–1.500 s	0.000s
F3-00	Startup speed	0.000–0.030 m/s	0.000m/s
F3-01	Startup holding time	0.000–0.500 s	0.000s

Figure 6-12 Startup timing sequence for eliminating static friction



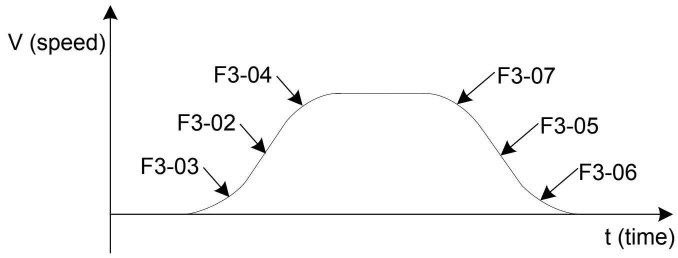
Bad riding comfort due to static friction may often exist in villa elevators. When there is large friction between the guide shoes and the guide rails, large static friction generates at the moment of startup, leading to bad riding comfort. Make the system starts up at the specified speed by setting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

■ Riding comfort adjustment to the running curve

Function Code	Parameter Name	Setting Range	Default
F3-02	Acceleration rate	0.200–1.500 s^2	0.600 $/s^2$
F3-03	Acceleration start jerk time	0.300–4.000 s	2.500 s
F3-04	Acceleration end jerk time	0.300–4.000 s	2.500 s

Function Code	Parameter Name	Setting Range	Default
F3-05	Deceleration rate	0.200–1.500 /s^2	0.600 /s^2
F3-06	Deceleration end jerk time	0.300–4.000 s	2.500 s
F3-07	Deceleration start jerk time	0.300–4.000 s	2.500 s

Figure 6-13 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 the value of F3-02 and increase the values of 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

6

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.

- 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).
- 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.
- 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.
- The riding comfort during running may be influenced if the brake arm is installed too tightly or released incompletely.
- 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.
- For asynchronous motor, abrasion or improper installation of the gearbox may also affect the riding comfort.

- 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).

◆ Leveling Accuracy Adjustment

1. Description of leveling components

- The length of the leveling plate needs to match the leveling sensor.

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

- Leveling sensor

  The leveling plate must be vertical to the leveling sensor.

  When the car arrives, the leveling plate must be into the leveling sensor by 2/3 of its own length.

- 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:

a. All-floor adjustment

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

F4-00 is used to adjust the car stop position at all floors. 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.

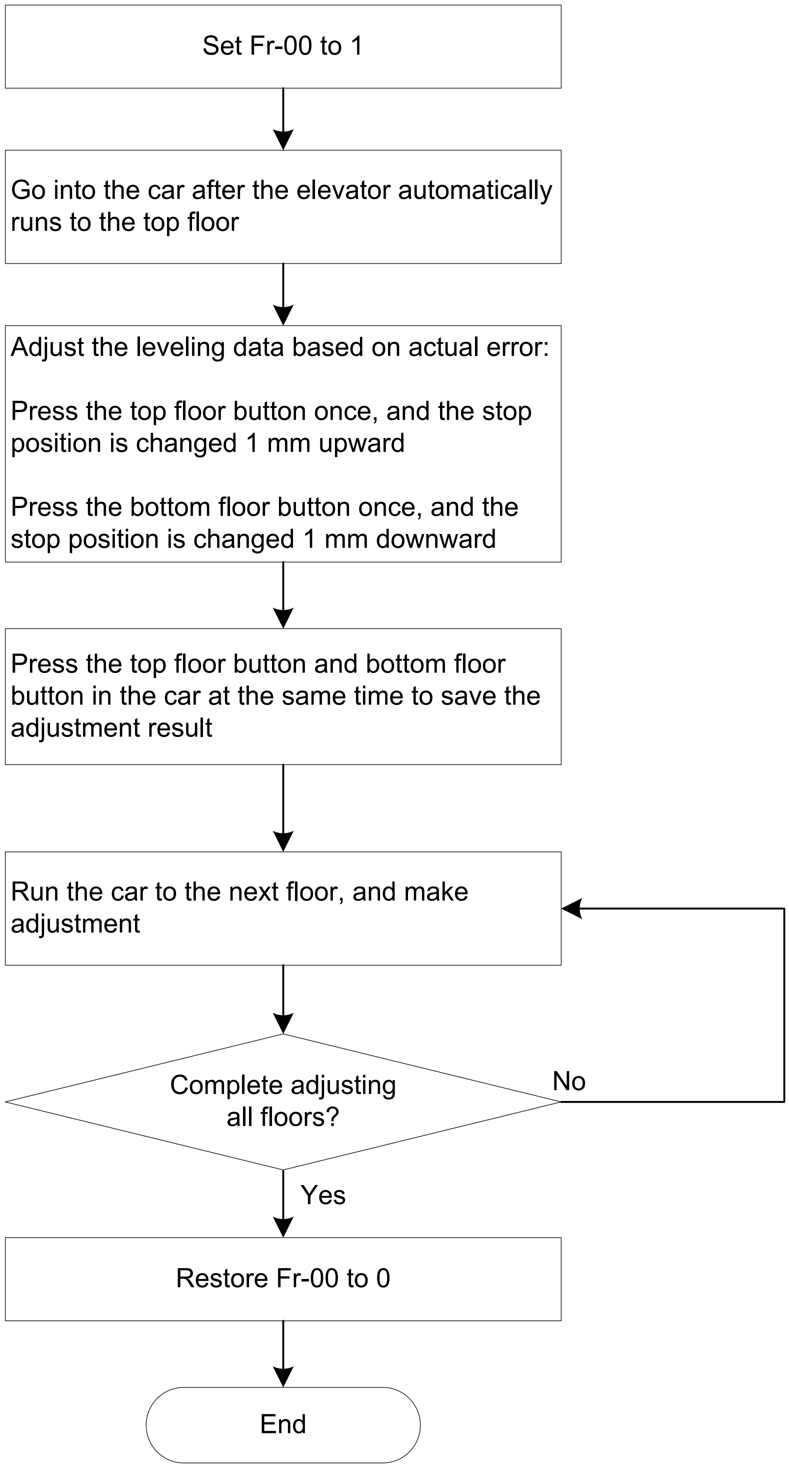
b. Single-floor adjustment

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

Function Code	Parameter Name	Setting Range	Default	Unit
Fr-00	Leveling adjustment function	0: Disabled 1: Enabled	0	-
Fr-01	Leveling adjustment record 1	00000–60060	30030	mm
Fr-02	Leveling adjustment record 2		30030	mm
…			…	
Fr-20	Leveling adjustment record 20		30030	mm

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

Figure 6-14 Single-floor leveling accuracy adjustment



More descriptions of the above adjustment steps are as follows:

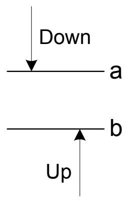
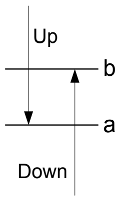
- Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
- After you set Fr-00 to 1, the elevator shields hall calls, automatically runs to the top floor, and keeps the door open after arrival.
- During adjustment, the car display board displays "00" 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 car display board 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 guidlines

- 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.

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

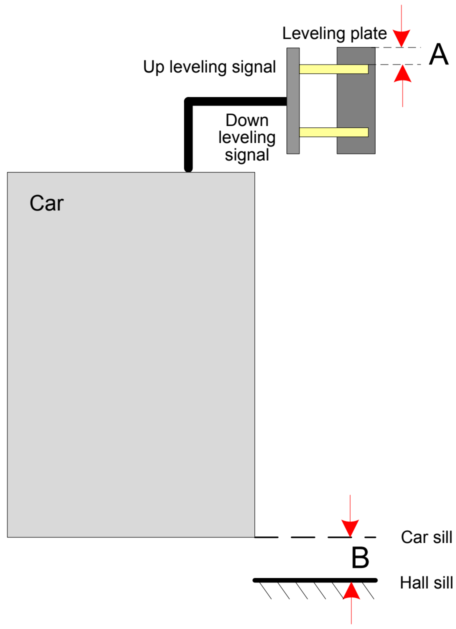
Then, adjust the stop positions of related floors by setting group Fr parameters.

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 6-15 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.

6.2 System Functions

6.2.1 Recommended Shorting PMSM Stator Scheme

Shorting PMSM stator means shorting phases UVW of the PMSM, which produces resistance to restrict movement of the elevator car. In field application, an auxiliary NC contact is usually added to the NO contact of the output contactor to short PMSM UVW phases to achieve the effect. It is feasible in theory but may cause overcurrent actually. Due to the poor quality of the contactor and the wiring of adding the auxiliary contact, the residual current of the controller is still high when the outputs UVW are shorted at abnormal stop. This results in an overcurrent fault and may damage the controller or motor.

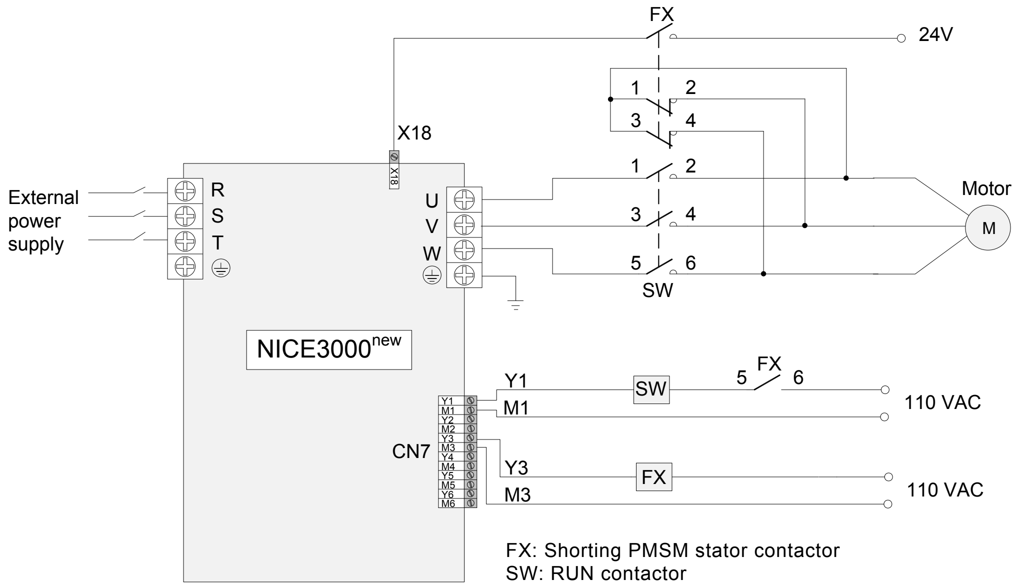
Monarch’s shorting PMSM stator scheme is as follows:

1. An independent contactor for shorting PMSM stator is installed, and the NC contact of this contactor implements the function of shorting PMSM stator.

2. 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.

The following figure shows wiring of the independent shorting PMSM stator contactor.

Figure 6-16 Wiring of the independent shorting PMSM stator contactor



The parameter setting in shorting PMSM stator mode is described in the following table.

Function Code	Parameter Name	Value	Description
F5-18	X18 function selection	30	Allocate X18 with "Input of shorting PMSM stator feedback signal".
F5-28	Y3 function selection	12	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

6.2.2 Automatic Emergency Evacuation at Power Failure

Passengers may be trapped in the car for a long time if power failure suddenly happens during use of the elevator. The emergency evacuation device needs to be configured in the system to solve the problem.

There are two emergency evacuation methods, described as follows:

Automatic Emergency Evaucautin Method	Priniple
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.

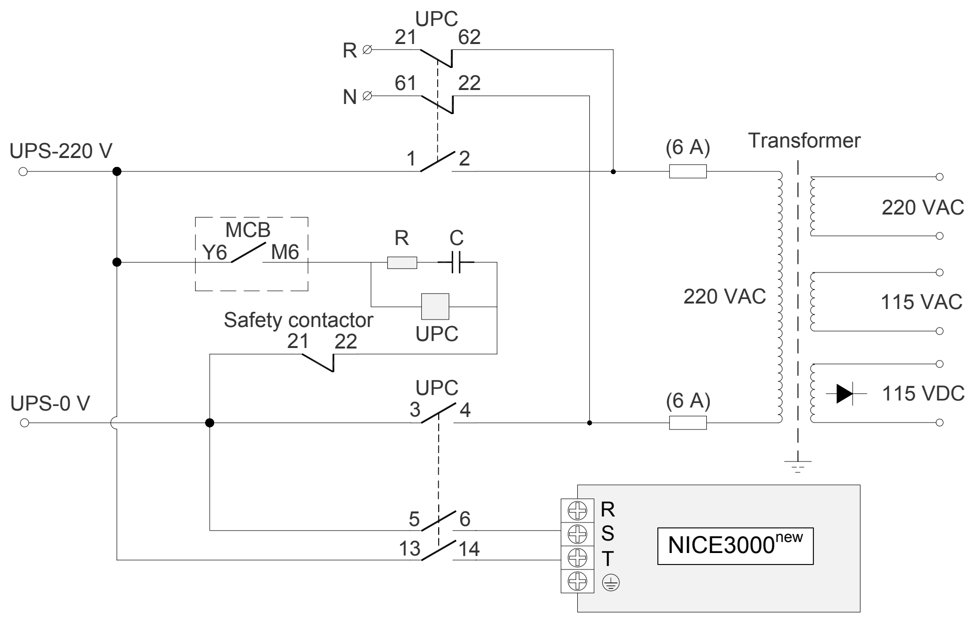
Standby Power Supply	Description
Uninterrupted power supply (UPS)	The (UPS) is used. The UPS RUN contactor and UPS control circuit must added in the control cabinet.

Standby Power Supply	Description
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.

1. 220 V UPS

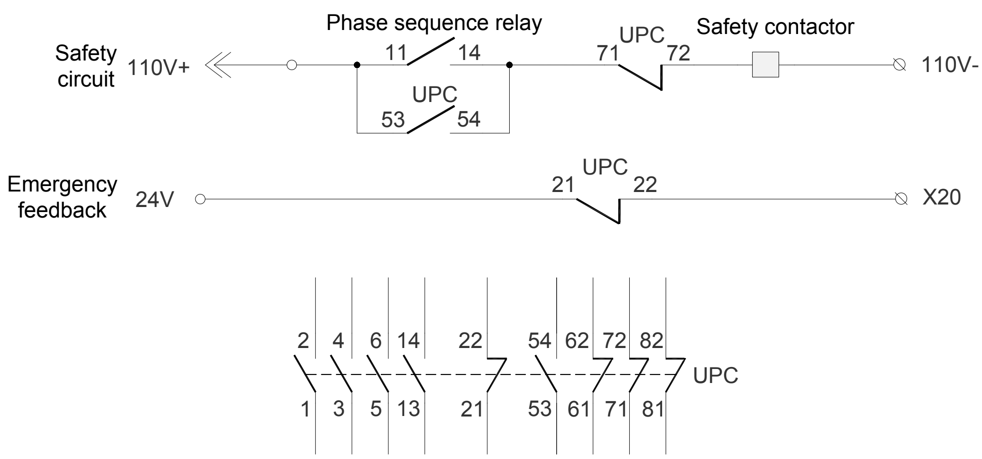
In this scheme, the 220 V UPS provides power supply to the main unit and the drive control circuit. The following figure shows the emergency 220 V UPS circuit.

Figure 6-17 220 V UPS circuit



The following figure shows various contacts of the contactors.

Figure 6-18 Various contacts of the contactors



The parameter setting related to emergency evacuation by controller drive is described in the following table.

Function Code	Parameter Name	Value	Remarks
F8-10	Emergency evacuation operation mode at power failure	1: UPS	-
F5-20 (X20)	X20 function selection	59 (UPS valid signal)	Assume that X20 is used as the NC input of emergency evacuation signal
F5-31 (Y6)	Y6 function selection	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	Parameter Name	Value	Remarks
F8-10	Emergency evacuation operation mode at power failure	0: Motor not running	-
F5-20 (X20)	X20 function selection	59 (UPS valid signal)	Assume that X20 is used as the NC input of emergency evacuation signal
F5-31 (Y6)	Y6 function selection	13 (Emergency evacuation automatic switchover)	Only Y6 can be used for emergency evacuation output.
F6-45	Bit15 (Shorting stator braking function)	1 (Enabled)	Enable the function of shorting stator braking.

The UPS power is recommended in the following table.

Table 6-9 Recommended UPS power for each power class

UPS Power	Controller Power
1 kVA (700–800 W)	P ≤ 5.5 kW
2 kVA (1400–1600 W)	5.5 kW < P ≤ 11 kW
3 kVA (2100–2400 W)	15 kW ≤ P ≤ 22 kW

2. ARD for elevator emergency evacuation

The ARD supplies power to the main circuit and control circuit. The following figure shows the schematic diagram.

The elevator ARD has its own control system. Note that 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.

Figure 6-19 Wiring of three-phase (380 V) elevator ARD

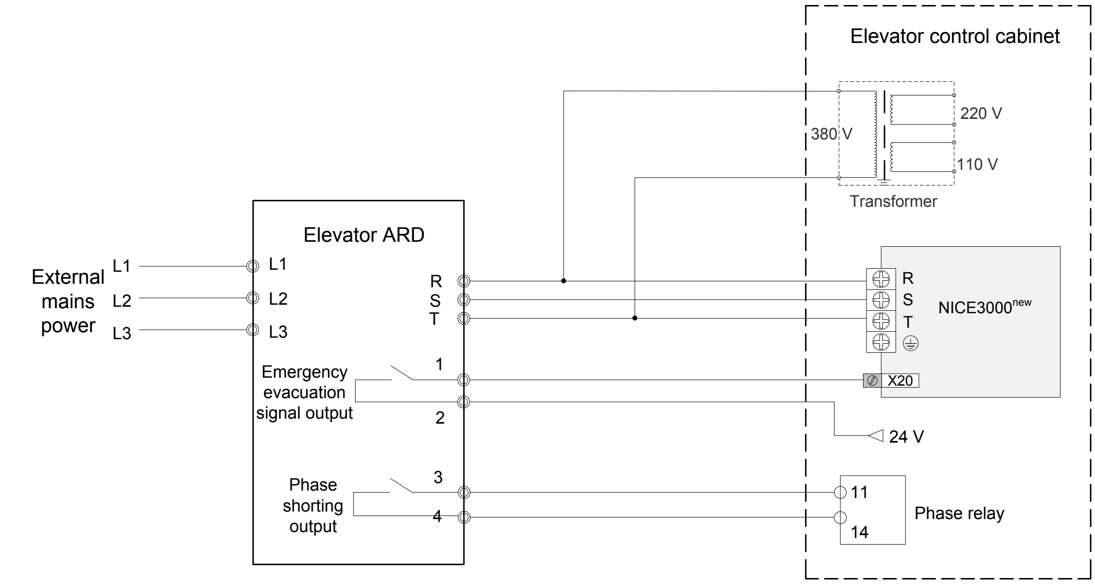
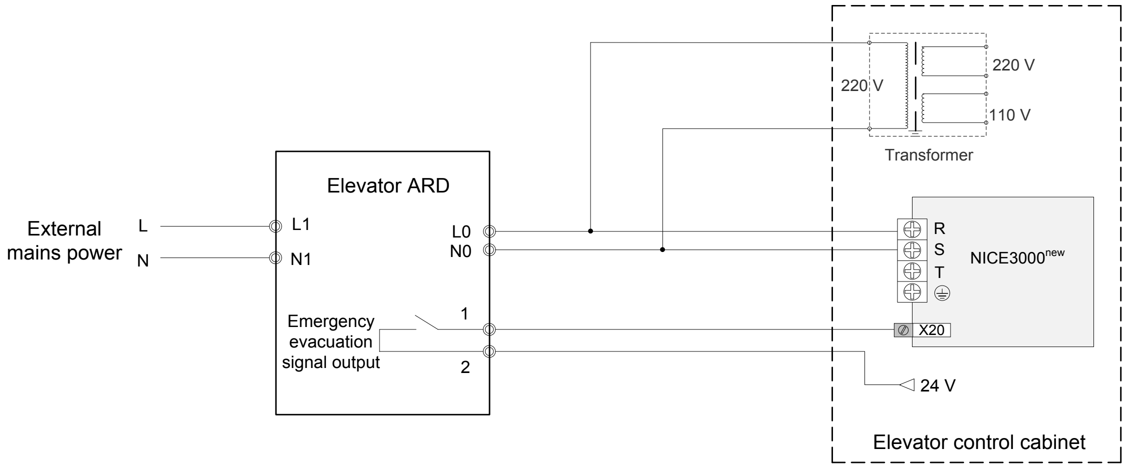


Figure 6-20 Wiring of single-phase (220 V) elevator ARD



The parameter setting related to emergency evacuation by controller drive is described in the following table.

Function Code	Parameter Name	Value	Remarks
F8-10	Emergency evacuation operation mode at power failure	1: UPS	-
F5-20 (X20)	X20 function selection	27 (Emergency evacuation signal)	Assume that X20 is used as the NO input of emergency evacuation signal.

The parameter setting related to emergency evacuation by shorting stator braking is described in the following table.

Function Code	Parameter Name	Value	Remarks
F8-10	Emergency evacuation operation mode at power failure	0: Motor not running	-

Function Code	Parameter Name	Value	Remarks
F5-20 (X20)	X20 function selection	27 (Emergency evacuation signal)	Assume that X20 is used as the NO input of emergency evacuation signal.

NOTE

- Select the ARD with the nominal output power equal to or larger than the rated motor 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.

3. Other parameters related to emergency evacuation

Function Code	Parameter Name	Setting Range
F3-22	Acceleration rate at emergency evacuation	0.100–1.300 m/s^2
F6-48	Emergency evacuation switching speed	0.010–0.630 m/s
F6-49	Evacuation parking floor	0 to F6-00
F8-09	Emergency evacuation operation speed at power failure	0.05 m/s

The detailed description of F6-45 is as follows.

<table>
<tr><th>Bit</th><th>Function Description</th><th colspan="6">Binary Setting</th><th>Remarks</th></tr>
<tr><td>Bit0</td><td rowspan="2">Direction determine mode</td><td>0</td><td rowspan="2">Automatically calculating the direction</td><td>0</td><td rowspan="2">Load direction determining (based on load cell data or half-load signal)</td><td>1</td><td rowspan="2">Direction of nearest landing floor</td><td rowspan="2">If the torque direction is automatically calculated, the no-load-cell function must be enabled, that is, F8-01 is set to 2.</td></tr>
<tr><td>Bit1</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td rowspan="2">Bit2</td><td rowspan="2">Stop position</td><td>1</td><td colspan="5">Stop at the base floor</td><td>-</td></tr>
<tr><td>0</td><td colspan="5">Stop at nearest landing floor</td><td>-</td></tr>
<tr><td>Bit4</td><td>Startup compensation</td><td>1</td><td colspan="5">Startup torque compensation valid in emergency evacuation running</td><td>When it is set that the torque direction is automatically calculated, automatic startup torque compensation is enabled.</td></tr>
<tr><td>Bit8</td><td>Emergency evacuation running time protection</td><td>1</td><td colspan="5">If the elevator does not arrive at the required floor after 50s emergency evacuation running time, E33 is reported.</td><td>This function is invalid when the function of switching over shorting stator braking mode to controller drive is used.</td></tr>
<tr><td>Bit10</td><td>Emergency buzzer output</td><td>1</td><td colspan="5">The buzzer output is active during UPS emergency evacuation running.</td><td>-</td></tr>
<tr><td>Bit12</td><td>Shorting stator braking mode switched over to controller drive</td><td>1</td><td colspan="5">Enable the function of switching over the shorting stator braking mode to controller drive.</td><td>-</td></tr>
</table>

Bit	Function Description	Binary Setting		Remarks
Bit13	Mode of shorting stator braking mode switched over to controller drive	1	Speed setting	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 controller starts to drive the elevator.
		0	Time setting	If the time of the shorting stator braking mode exceeds 50s, the controller starts to drive the elevator.
Bit14	Emergency evacuation exit mode	1	Exit at door close limit	-
		0	Exit at door open limit	-
Bit15	Shorting stator braking function	1	Enable this function.	When this function is enabled, the setting of related function codes becomes effective.

6.2.3 Parallel/Group Control

The NICE3000new provides the function of elevator parallel or group control:

- Parallel control of 2 elevators implemented by directly using the CAN communication port
- Group control of multiple elevators with together use of the group control board

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◆ Parallel Control

1. Default parallel control scheme (CAN communication port CN3)

The following table describes the parameter setting of parallel control implemented at the CAN communication port CN3.

Function Code	Parameter Name	Setting Range	Setting in Parallel Control	Remarks
F6-07	Number of elevators in parallel/group mode	1–8	2	
F6-08	Elevator No.	1–8	Master elevator: 1 Slave elevator: 2	
F5-30	Y5 function selection	-	14 (Controller healthy)	Assume that Y5 is used as the transfer relay.

When the CAN communication port (CN3) is used to implement parallel control, you need to set the CTB addresses, as described in the following table.

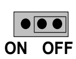
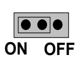
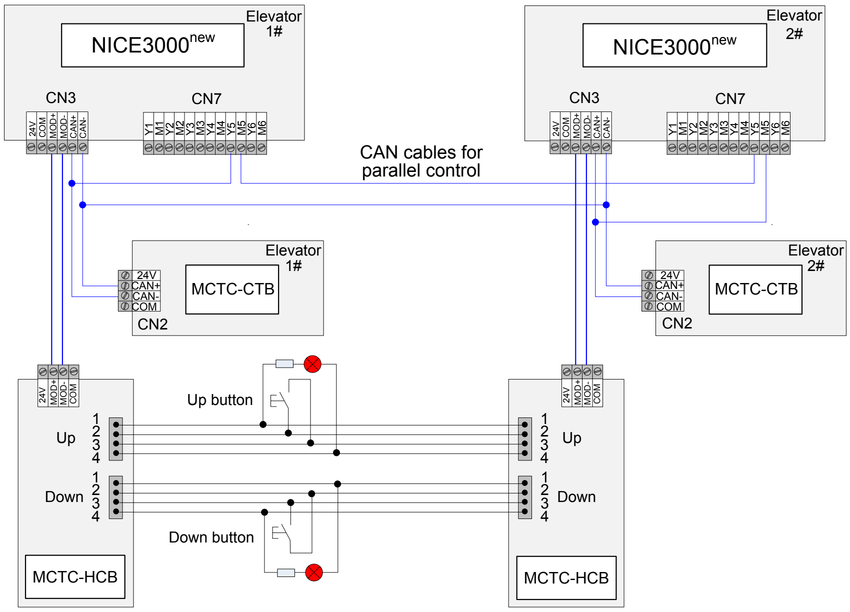
CTB	Jumper Setting	Description
CTB of elevator 1#	 J2	Short J2 at the OFF position or do not connect it. Set the CTB as the master (address: 1).
CTB of elevator 2#	 J2	Short J2 at the ON position or do not connect it. Set the CTB as the slave (address: 2).

Figure 6-21 Wiring of default parallel control scheme (CN3)



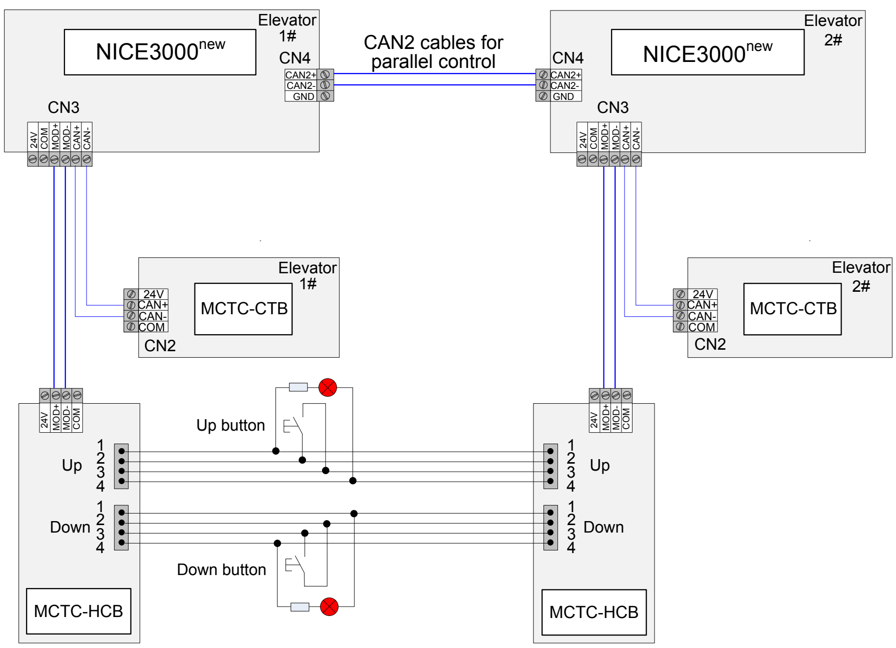
2. Alternative parallel control scheme (CAN2 communication port CN4)

The following table lists the parameter setting of parallel control implemented at the CAN2 communication port CN4.

Function Code	Parameter Name	Setting Range	Setting in Parallel Control
F6-07	Number of elevators in parallel/ group mode	1–8	2
F6-08	Elevator No.	1–8	Master elevator: 1 Slave elevator: 2
F6-09	Program control selection 2	-	Bit3 (Parallel/Group control implemented at CAN2) = 1

For this scheme, you need not set the CTB address.

Figure 6-22 Wiring of alternative parallel control scheme (CN4)



3. Use description of parallel control

- Definition of floors:

  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. Parallel running can be implemented only when the HCB address set for one elevator is the same as that for the other elevator in terms of the same floor.

- 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.

Example:

Assume that there are two elevators in parallel mode:

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.

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Elevator 2# has four overground user floors ,but stops only at floor 1, floor 3, and floor 4.

Figure 6-23 Floor diagram of two elevators in parallel control

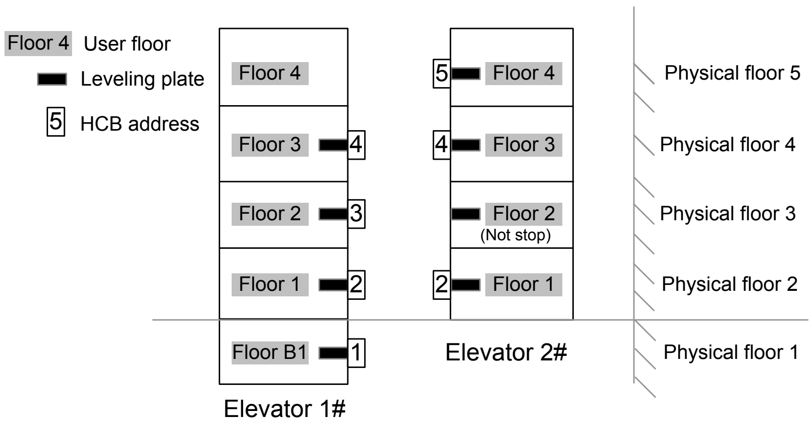


Table 6-10 Parameter setting and HCB addresses of two elevators

		Elevator 1		Elevator 2	
Number of elevators in parallel/ group mode (F6-07)		2		2	
Elevator No. (F6-08)		1		2	
Actual floor	Physical floor	HCB address	HCB display	HCB address	HCB display
B1	1	1	FE-01 = 1101		
1	2	2	FE-02 = 1901	2	FE-02 = 1901
2	3	3	FE-03 = 1902	Non-stop floor, no hall call, but leveling plate required	FE-03 = 1902
3	4	4	FE-04 = 1903	4	FE-04 = 1903
4	5	No hall call	No hall call	5	FE-05 = 1904
Bottom floor (F6-01)		1		2	
Top floor (F6-00)		4		5	
Service floor (F6-05)		65535		65531 (not stop at physical floor 3)	

◆ Group Control

A GCB (MCTC-GCB-A) is additionally required to implement group control of more than two elevators.

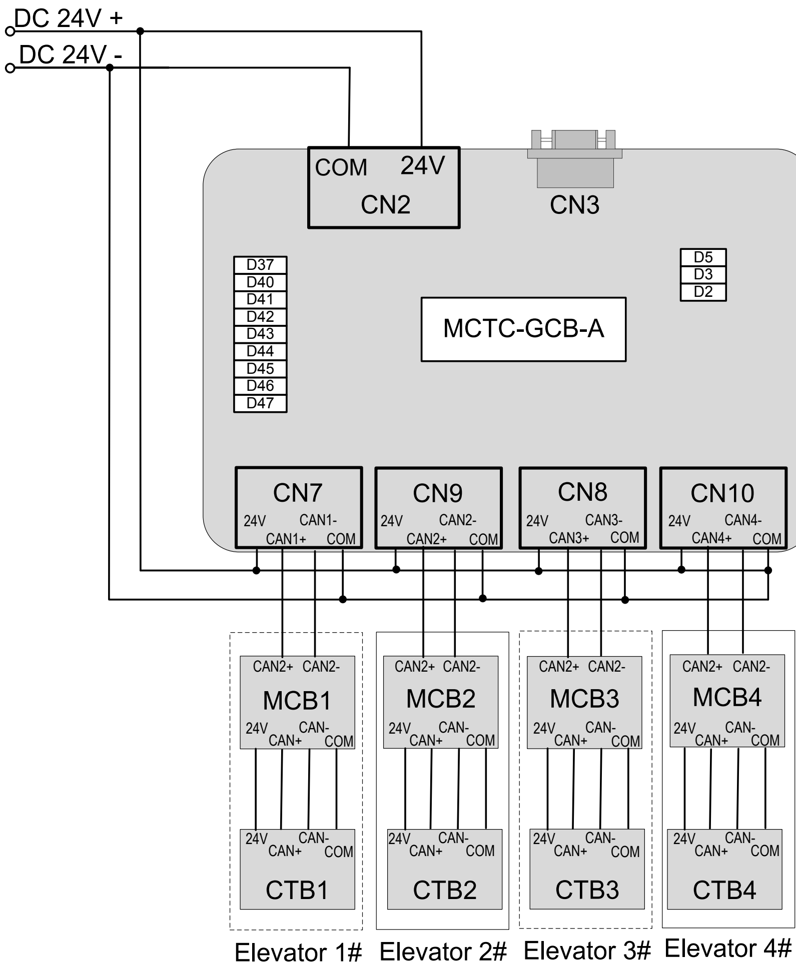
- A single GCB supports group control of a maximum of 4 elevators.
- If group control of more than 4 elevators is required, two GCBs need to be installed. This scheme is customized. For details, consult us.

The parameter setting related to group control is described in the following table.

Function Code	Parameter Name	Setting Range	Setting in Group Control	Remarks
F6-07	Number of elevators in parallel/group mode	1–8	1–8	Set the value as the actual number of elevators in group control.
F6-08	Elevator No.	1–8	1–8	Value "1": elevator 1# Value "2": elevator 2# By analog.
F6-09	Program control selection 2	-	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: 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.

Figure 6-24 Wiring of group control



For more details on the MCTC-GCB, see the description in section 4.4.4.

6.2.4 Opposite Door Control

The NICE3000new supports four opposite door control modes: mode 1, mode 2, mode 3, and mode 4, as described in the following table.

Table 6-11 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.

◆ Recommended Method

1. Method description

Table 6-12 Setting of recommended opposite door control method

Type	Door Control Mode	Parameter Setting		Service Floor	HCB Address Setting	Operation Box CCB Wiring
		Mode Selection	Other Parameters			
Mode 1	Simultaneous control	FC-04 = 0	Fb-00 = 2, F8-16 = N (N > F6-00)	20	HCB address of front door: 1–20 HCB address of back door: N to N+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.
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 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.

2. CCB wiring

For modes 1, 2, and 3, either a single operation box or double operation boxes are supported. The CCB wiring is shown in the following figures.

Figure 6-25 CCB wiring of single operation box

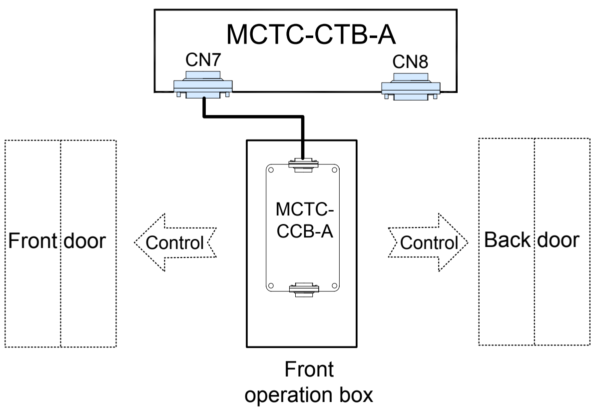


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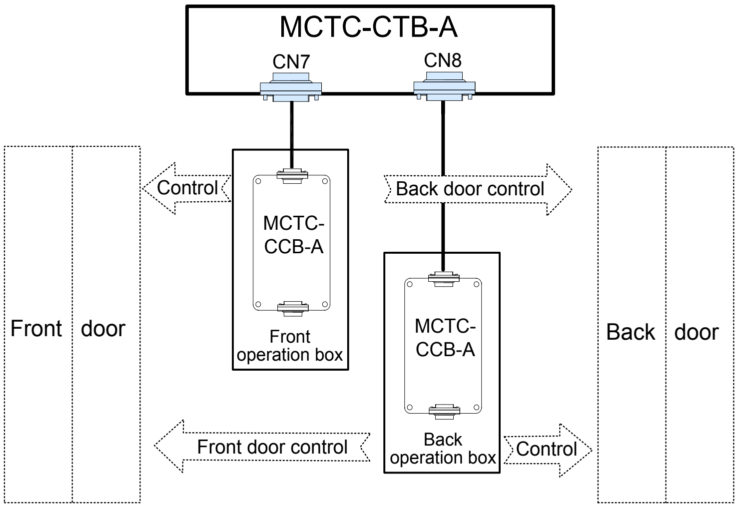
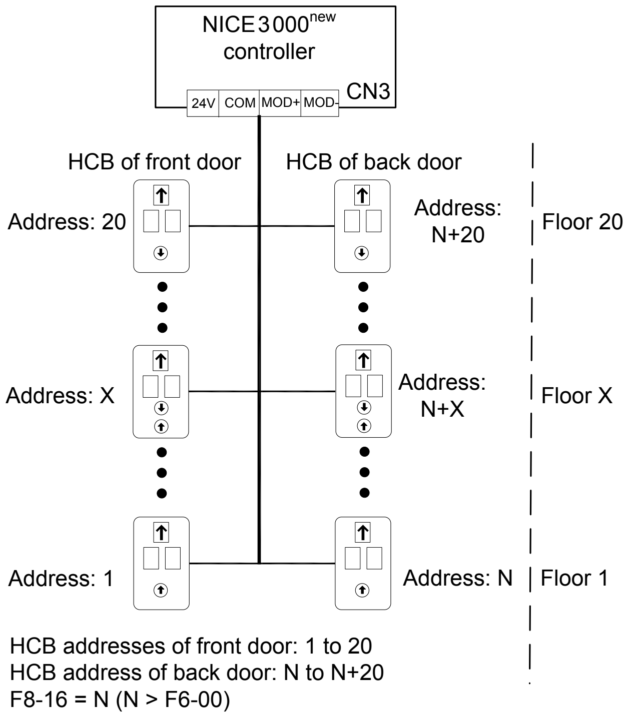
Figure 6-26 CCB wiring of double operation boxes



3. HCB setting

Figure 6-27 HCB setting diagram



6

◆ Supplementary Method (Old Method of NICE3000)

This method is the old one used in the NICE3000. The NICE3000new is compatible with this old method.

1. Method description

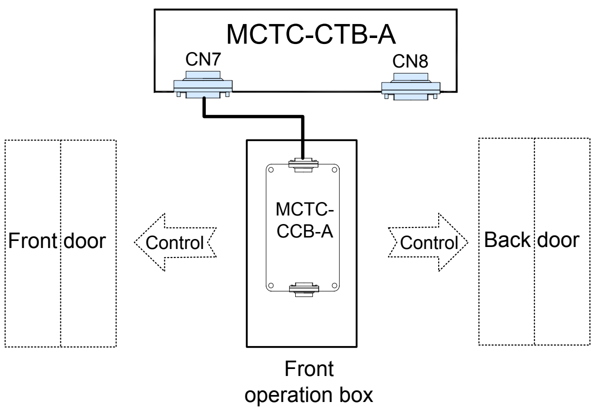
Table 6-13 Parameter setting of old opposite door control method

<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">HCB Address Setting</th><th rowspan="2">Operation Box CCB Wiring</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,
FE-33 Bit15 = 1</td><td>15</td><td rowspan="4">HCB address of front door: 1–15
HCB address of back door: 17–31</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></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
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 selected by the control switch in the car. 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>

2. CCB wiring

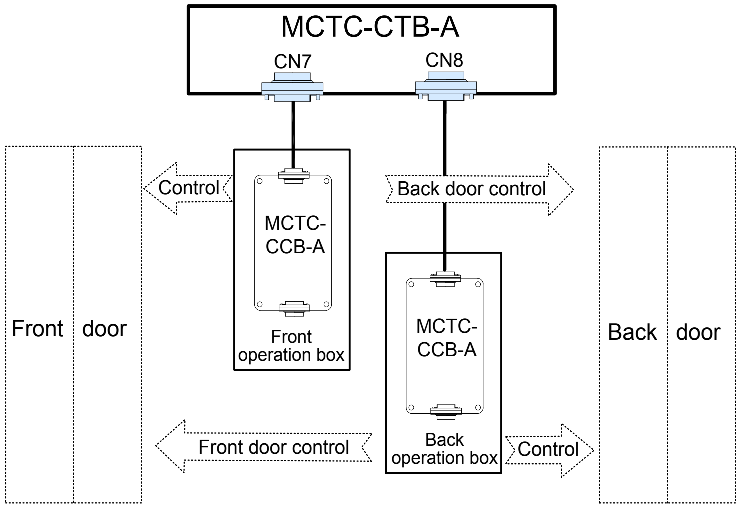
The following figures show the CCB wiring of modes 1, 2, and 3.

Figure 6-28 CCB wiring of single operation box (old method)



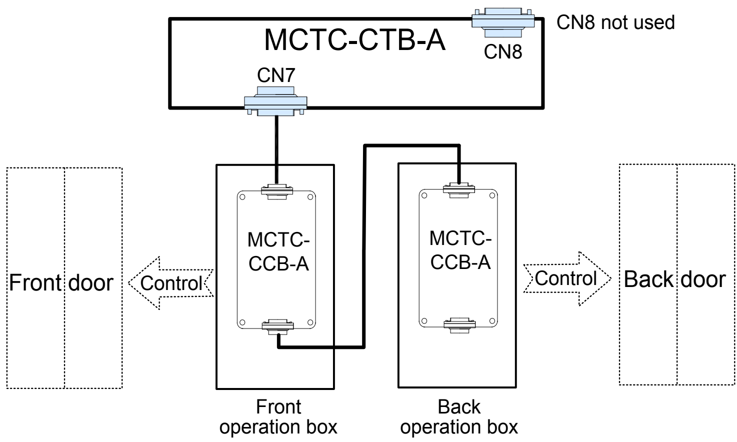
6

Figure 6-29 CCB wiring of double operation boxes (old method)



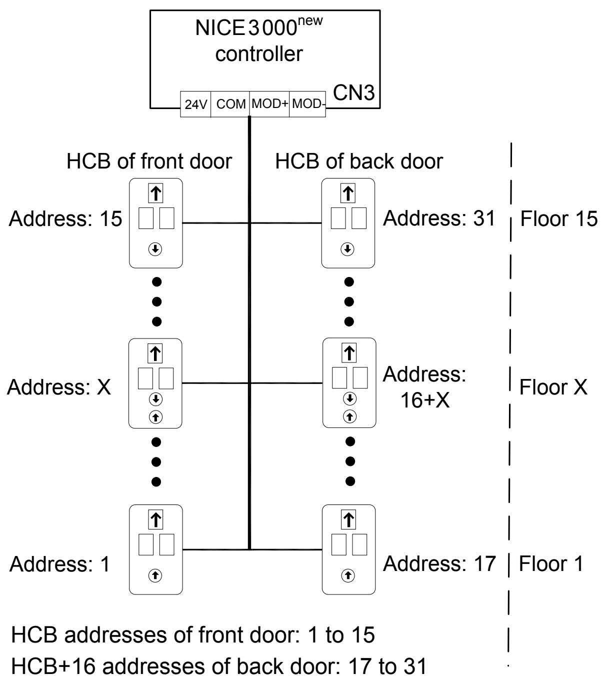
The following figure shows the CCB wiring of modes 4.

Figure 6-30 CCB wiring of mode 4 (old method)



3. HCB setting

Figure 6-31 HCB setting of 15-floor opposite door control (old method)



7

Function Code Table

Chapter 7 Function Code Table

7.1 Brief Introduction

- There are a total of 18 function code groups, each of which includes several function codes. The function codes adopt the three-level menu. The function code group number is Level-I menu; the function code number is Level-II menu; the function code setting is Level-III menu.
- The meaning of each column in the function code table is as follows:

Item	Definition
Function code	Indicates the function code number.
Parameter name	Indicates the parameter name of the function code.
Setting range	Indicates the setting range of the parameter.
Default	Indicates the default setting of the parameter at factory.
Unit	Indicates the measurement unit of the parameter.
Property	Indicates whether the parameter can be modified (including the modification conditions).
Page	Indicates the page that provides detailed description of this function code in Chapter 8.

The modification property of the parameters includes three types, described as follows:

" ☆ ": 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.

7.2 Function Code Groups

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

F0	Basic parameters	F9	Time parameters
F1	Motor parameters	FA	Keypad setting parameters
F2	Vector control parameters	Fb	Door function parameters
F3	Running control parameters	FC	Protection function parameters
F4	Floor parameters	Fd	Communication parameters
F5	Terminal function parameters	FE	Elevator function parameters
F6	Basic elevator parameters	FF	Factory parameters
F7	Test function parameters	FP	User parameters
F8	Enhanced function parameters	Fr	Leveling adjustment parameters

7.3 Function Code Table

Function Code	Parameter 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	-	★	192
F0-01	Command source selection	0: Operation panel control 1: Distance control	1	-	★	192
F0-02	Running speed under operation panel control	0.050 to F0-04	0.050	m/s	☆	193
F0-03	Maximum running speed	0.250 to F0-04	1.600	m/s	★	193
F0-04	Rated elevator speed	0.250–4.000	1.600	m/s	★	193
F0-05	Rated elevator load	300–9999	1000	kg	★	194
F0-06	Maximum frequency	20.00–99.00	50.00	Hz	★	194
F0-07	Carrier frequency	0.5–16.0	6.0	kHz	★	194
Group F1: Motor parameters						
F1-00	Encoder type	0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: ECN413/1313 absolute encoder	0	-	★	195
F1-01	Rated motor power	0.7–75.0	Model dependent	kW	★	195
F1-02	Rated motor voltage	0–600	Model dependent	V	★	195
F1-03	Rated motor current	0.00–655.00	Model dependent	A	★	195
F1-04	Rated motor frequency	0.00–99.00	Model dependent	Hz	★	195
F1-05	Rated motor speed	0–3000	Model dependent	RPM	★	195
F1-06	Encoder initial angle (synchronous motor)	0.0–359.9	0	Degree (°)	★	196
F1-07	Encoder angle at power-off (synchronous motor)	0.0–359.9	0	Degree (°)	★	196
F1-08	Synchronous motor wiring mode	0–15	0	-	★	196

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F1-09	Current filter time (synchronous motor)	0–3	0	-	★	197
F1-10	Encoder verification selection	0–65535	0	-	★	195
F1-11	Auto-tuning mode	0: No operation 1: With-load auto-tuning 2: No-load auto-tuning 3: Shaft auto-tuning	0	-	★	195
F1-12	Encoder pulses per revolution	0–10000	2048	PPR	★	195
F1-13	Encoder wire-breaking detection time	0–10.0	1.0	s	★	197
F1-14	Stator resistance (asynchronous motor)	0.000–30.000	Model dependent	Ω	★	196
F1-15	Rotor resistance (asynchronous motor)	0.000–30.000	Model dependent	Ω	★	196
F1-16	Leakage inductance (asynchronous motor)	0.00–300.00	Model dependent	mH	★	196
F1-17	Mutual inductance (asynchronous motor)	0.1–3000.0	Model dependent	mH	★	196
F1-18	Magnetizing current (asynchronous motor)	0.01–300.00	Model dependent	A	★	196
F1-19	Shaft Q inductance (torque)	0.00–650.00	3.00	mH	★	196
F1-20	Shaft D inductance (excitation)	0.00–650.00	3.00	mH	★	196
F1-21	Back EMF	0–65535	0	-	★	196
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor	1	-	★	195
Group F2: Vector control parameters						
F2-00	Speed loop proportional gain Kp1	0–100	40	-	★	197
F2-01	Speed loop integral time Ti1	0.01–10.00	0.60	s	★	197
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	★	197
F2-03	Speed loop proportional gain Kp2	0–100	35	-	★	197
F2-04	Speed loop integral time Tp2	0.01–10.00	0.80	s	★	197
F2-05	Switchover frequency 2	F2-02 to F0-06	5.00	Hz	★	197
F2-06	Current loop Kp1 (torque)	10–500	60	-	★	198

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F2-07	Current loop Kp1 (torque)	10–500	30	-	★	198
F2-08	Torque upper limit	0.0–200.0	150.0	%	★	199
F2-10	Elevator running direction	0: Direction unchanged 1: Direction reversed	0	-	★	199
F2-11	Zero servo current coefficient	0.20–50.0	15	-	★	198
F2-12	Zero servo speed loop Kp	0.00–2.00	0.5	-	★	198
F2-13	Zero servo speed loop Ki	0.00–2.00	0.6	-	★	198
F2-16	Torque acceleration time	1–500	1	ms	★	198
F2-17	Torque deceleration time	1–500	350	ms	★	198
F2-18	Startup acceleration time	0.000–1.500	0.000	s	★	199
Group F3: Running control parameters						
F3-00	Startup speed	0.000–0.030	0.000	m/s	★	199
F3-01	Startup holding time	0.000–0.500	0.000	s	★	199
F3-02	Acceleration rate	0.200–1.500	0.600	m/s^2	★	199
F3-03	Acceleration start jerk time	0.300–4.000	2.500	s	★	199
F3-04	Acceleration end jerk time	0.300–4.000	2.500	s	★	199
F3-05	Deceleration rate	0.200–1.500	0.600	m/s^2	★	199
F3-06	Deceleration end jerk time	0.300–4.000	2.500	s	★	199
F3-07	Deceleration start jerk time	0.300–4.000	2.500	s	★	199
F3-08	Special deceleration rate	0.200–1.500	0.900	m/s^2	★	202
F3-09	Pre-deceleration distance	0–90.0	0.0	mm	★	199
F3-10	Re-leveling speed	0.000–0.080	0.040	m/s	★	193
F3-11	Inspection speed	0.100–0.630	0.250	m/s	★	193
F3-12	Position of up slow-down 1	0.000–300.00	0.00	m	★	202
F3-13	Position of down slow-down 1	0.000–300.00	0.00	m	★	202
F3-14	Position of up slow-down 2	0.000–300.00	0.00	m	★	202
F3-15	Position of down slow-down 2	0.000–300.00	0.00	m	★	202

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F3-16	Position of up slow-down 3	0.000–300.00	0.00	m	★	202
F3-17	Position of down slow-down 3	0.000–300.00	0.00	m	★	202
F3-18	Zero-speed control time at startup	0.000–1.000	0.200	s	★	201
F3-19	Brake release delay	0.000–2.000	0.600	s	★	201
F3-20	Zero-speed control time at end	0.000–1.000	0.300	s	★	201
F3-21	Low-speed re-leveling speed	0.080 to F3-11	0.100	m/s	★	193
F3-22	Acceleration rate at emergency evacuation	0.100–1.300	0.100	m/s^2	★	219
F3-24	Slip experiment function	0: Disabled 1: Enabled	0	-	★	202
Group F4: Floor parameters						
F4-00	Leveling adjustment	0–60	30	mm	★	252
F4-01	Current floor	F6-01 to F6-00	1	-	★	202
F4-02	High byte of current floor position	0–65535	1	Pulses	●	202
F4-03	Low byte of current floor position	0–65535	34464	Pulses	●	202
F4-04	Length 1 of leveling plate	0–65535	0	Pulses	★	203
F4-05	Length 2 of leveling plate	0–65535	0	Pulses	★	203
F4-06	High byte of floor height 1	0–65535	0	Pulses	★	203
F4-07	Low byte of floor height 1	0–65535	0	Pulses	★	203
F4-08	High byte of floor height 2	0–65535	0	Pulses	★	203
F4-09	Low byte of floor height 2	0–65535	0	Pulses	★	203
F4-10	High byte of floor height 3	0–65535	0	Pulses	★	203
F4-11	Low byte of floor height 3	0–65535	0	Pulses	★	203
F4-12	High byte of floor height 4	0–65535	0	Pulses	★	203
F4-13	Low byte of floor height 4	0–65535	0	Pulses	★	203
F4-14	High byte of floor height 5	0–65535	0	Pulses	★	

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Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F4-15	Low byte of floor height 5	0–65535	0	Pulses	★	203
F4-16	High byte of floor height 6	0–65535	0	Pulses	★	203
F4-17	Low byte of floor height 6	0–65535	0	Pulses	★	203
F4-18	High byte of floor height 7	0–65535	0	Pulses	★	203
F4-19	Low byte of floor height 7	0–65535	0	Pulses	★	203
F4-20	High byte of floor height 8	0–65535	0	Pulses	★	203
F4-21	Low byte of floor height 8	0–65535	0	Pulses	★	203
F4-22	High byte of floor height 9	0–65535	0	Pulses	★	203
F4-23	Low byte of floor height 9	0–65535	0	Pulses	★	203
F4-24	High byte of floor height 10	0–65535	0	Pulses	★	203
F4-25	Low byte of floor height 10	0–65535	0	Pulses	★	203
Floor height 11 to floor height 37						
F4-80	High byte of floor height 38	0–65535	0	Pulses	★	203
F4-81	Low byte of floor height 38	0–65535	0	Pulses	★	203
F4-82	High byte of floor height 39	0–65535	0	Pulses	★	203
F4-83	Low byte of floor height 39	0–65535	0	Pulses	★	203
Group F5: Terminal function parameters						
F5-00	Attendant/Automatic switchover time	3–200	3	s	★	218

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<table>
<tr><th>Function Code</th><th>Parameter Name</th><th>Setting Range</th><th>Default</th><th>Unit</th><th>Property</th><th>Page</th></tr>
<tr><td>F5-01</td><td>X1 function selection</td><td rowspan="12">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 up signal NO/NC
10/42: Inspection down 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
Others:
00: Invalid
11/43: Fire emergency signal NO/NC
20/52: Up slow-down 3 signal NO/NC
21/53: Down slow-down 3 signal NO/NC
23/55: Firefighter running signal NO/NC
(To be continued)</td><td>33</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-02</td><td>X2 function selection</td><td>35</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-03</td><td>X3 function selection</td><td>34</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-04</td><td>X4 function selection</td><td>4</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-05</td><td>X5 function selection</td><td>5</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-06</td><td>X6 function selection</td><td>38</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-07</td><td>X7 function selection</td><td>39</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-08</td><td>X8 function selection</td><td>22</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-09</td><td>X9 function selection</td><td>40</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-10</td><td>X10 function selection</td><td>09</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-11</td><td>X11 function selection</td><td>10</td><td>-</td><td>★</td><td>204</td></tr>
<tr><td>F5-12</td><td>X12 function selection</td><td>44</td><td>-</td><td>★</td><td>204</td></tr>
</table>

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F5-13	X13 function selection	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 (End)	45	-	★	204
F5-14	X14 function selection		48	-	★	204
F5-15	X15 function selection		49	-	★	204
F5-16	X16 function selection		50	-	★	204
F5-17	X17 function selection		51	-	★	204
F5-18	X18 function selection		00	-	★	204
F5-19	X19 function selection		00	-	★	204
F5-20	X20 function selection		00	-	★	204
F5-21	X21 function selection		00	-	★	204
F5-22	X22 function selection		00	-	★	204
F5-23	X23 function selection		00	-	★	204
F5-24	X24 function selection		00	-	★	204
F5-25	CTB input type	0–511	320	-	★	209

<table>
<tr><th>Function Code</th><th>Parameter Name</th><th>Setting Range</th><th>Default</th><th>Unit</th><th>Property</th><th>Page</th></tr>
<tr><td>F5-26</td><td>Y1 function selection</td><td rowspan="6">01: RUN contactor control
02: Brake contactor control
03: Shorting door lock circuit contactor control
04: Fire emergency floor arrival feedback
Others:
00: Invalid
05: Door 1 open
06: Door 1 close
07: Door 2 open
08: Door 2 close
09: Brake and RUN contactors healthy
10: Fault state
11: Running monitor
12: Shorting PMSM 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</td><td>1</td><td>-</td><td>★</td><td>207</td></tr>
<tr><td>F5-27</td><td>Y2 function selection</td><td>2</td><td>-</td><td>★</td><td>207</td></tr>
<tr><td>F5-28</td><td>Y3 function selection</td><td>3</td><td>-</td><td>★</td><td>207</td></tr>
<tr><td>F5-29</td><td>Y4 function selection</td><td>4</td><td>-</td><td>★</td><td>207</td></tr>
<tr><td>F5-30</td><td>Y5 function selection</td><td>0</td><td>-</td><td>★</td><td>207</td></tr>
<tr><td>F5-31</td><td>Y6 function selection</td><td>0</td><td>-</td><td>★</td><td>207</td></tr>
<tr><td>F5-32</td><td>Communication state display</td><td>-</td><td>-</td><td>-</td><td>●</td><td>209</td></tr>
</table>

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F5-33	Terminal program control	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 cancelled immediately at door open limit Bit9: Car stop and zero-speed torque holding at abnormal brake feedback	0	-	★	256
F5-34	Terminal state display	Monitoring of I/O terminals on MCB	-	-	●	213
F5-35	Terminal state display	Monitoring of I/O terminals on CTB, CCB and HCB	-	-	●	213
F5-36	Load cell input selection	0: MCB digital input 1: CTB digital input 2: CTB analog input 3: MCB analog input	1	-	★	209
F5-37	X25 function selection	0: Invalid 4: Safety circuit signal 5: Door lock circuit signal	0	-	★	207
F5-38	X26 function selection		0	-	★	207
F5-39	X27 function selection		0	-	★	207
Group F6: Basic elevator parameters						
F6-00	Top floor of the elevator	F6-01 to 40	9	-	★	214
F6-01	Bottom floor of the elevator	1 to F6-00	1	-	★	214
F6-02	Parking floor	F6-01 to F6-00	1	-	★	217
F6-03	Fire emergency floor	F6-01 to F6-00	1	-	★	221
F6-04	Elevator lock floor	F6-01 to F6-00	1	-	★	223
F6-05	Service floors 1	0–65535	65535	-	★	214
F6-06	Service floors 2	0–65535	65535	-	★	214
F6-07	Number of elevators in parallel/group mode	1–8	1	-	★	217
F6-08	Elevator No.	1–8	1	-	★	217

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F6-09	Elevator program control	Bit0: Dispersed waiting 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) Bit 9: 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	0	-	★	217
F6-10	Leveling sensor filter time	10–50	14	ms	★	221
F6-11	Elevator function selection	Bit1: Disabling returning to base floor for verification Bit2: Cancelling 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 and close once after inspection turned to normal Bit10: Buzzer not tweet upon re-leveling Bit11: Super short floor function Bit12: Fault auto reset 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	-	★	221
F6-12	VIP floor	0 to F6-00	0	-	★	220
F6-13	Security floor	0 to F6-00	0	-	★	223
F6-14	Start time of down collective selective 1	00.00–23.59	00.00	HH.MM	☆	217
F6-15	End time of down collective selective 1	00.00–23.59	00.00	HH.MM	☆	217

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F6-16	Start time of down collective selective 2	00.00–23.59	00.00	HH.MM	☆	217
F6-17	End time of down collective selective 2	00.00–23.59	00.00	HH.MM	☆	217
F6-18	Start time of time-based floor service 1	00.00–23.59	00.00	HH.MM	☆	216
F6-19	End time of time-based floor service 1	00.00–23.59	00.00	HH.MM	☆	216
F6-20	Service floor 1 of time-based floor service 1	0–65535	65535	-	☆	216
F6-21	Service floor 2 of time-based floor service 1	0–65535	65535	-	☆	216
F6-22	Start time of time-based floor service 2	00.00–23.59	00.00	HH.MM	☆	216
F6-23	End time of time-based floor service 2	00.00–23.59	00.00	HH.MM	☆	216
F6-24	Service floor 1 of time-based floor service 2	0–65535	65535	-	☆	216
F6-25	Service floor 2 of time-based floor service 2	0–65535	65535	-	☆	216
F6-26	Peak 1 start time	00.00–23.59	00.00	HH.MM	☆	217
F6-27	Peak 1 end time	00.00–23.59	00.00	HH.MM	☆	217
F6-28	Peak 1 floor	F6-01 to F6-00	1	-	★	218
F6-29	Peak 2 start time	00.00–23.59	00.00	HH.MM	☆	218
F6-30	Peak 2 end time	00.00–23.59	00.00	HH.MM	☆	218
F6-31	Peak 2 floor	F6-01 to F6-00	1	-	★	218
F6-35	Service floor 3	0–65535	65535	-	☆	214
F6-36	Service floor 3 of time-based floor service 1	0–65535	65535	-	☆	216
F6-37	Service floor 3 of time-based floor service 2	0–65535	65535	-	☆	216
F6-38	Elevator lock start time	00.00–23.59	00.00	HH.MM	☆	223
F6-39	Elevator lock end time	00.00–23.59	00.00	HH.MM	☆	223

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
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 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	0	-	★	221
F6-41	Program control selection 2	Bit2: Inspection to stop due to slow-down 1 Bit4: Buzzer tweet during door open delay Bit6: Cancelling 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	-	★	223

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F6-42	Program control selection 3	Bit1: Cancelling 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	0	-	★	221
F6-43	Attendant function selection	Bit0: Calls cancelled 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	0	-	★	218
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 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	-	★	222

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
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 Bit4: Compensation at startup Bit8: Emergency running time protection Bit10: Emergency buzzer output Bit12: Shorting stator braking mode switched over to controller drive Bit13: Mode of shorting stator braking mode switched over to controller drive Bit14: Emergency evacuation exit mode Bit15: Shorting stator braking function	0	-	★	219
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	s	★	220
F6-47	Blinking advance time	0.0–15.0	0	s	☆	221
F6-48	Emergency evacuation switching speed	0.010–0.630	0.010	m/s	★	193
F6-49	Evacuation parking floor	0 to F6-00	0	-	★	219
Group F7: Test function parameters						
F7-00	Car call floor registered	0 to F6-00	0	-	☆	224
F7-01	Up call floor registered	0 to F6-00	0	-	☆	224
F7-02	Down call floor registered	0 to F6-00	0	-	☆	224
F7-03	Random running times	0–60000	0	-	☆	224
F7-04	Hall call forbidden	0: No 1: Yes	0	-	☆	224
F7-05	Door open forbidden	0: No 1: Yes	0	-	☆	224

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Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F7-06	Overload function	0: Disabled 1: Enabled	0	-	☆	224
F7-07	Limit switch forbidden	0: No 1: Yes	0	-	☆	224
F7-08	Time interval of random running	0–1000	0	s	☆	224
Group F8: Enhanced function parameters						
F8-00	Load for load cell auto-tuning	0–100	0	%	★	225
F8-01	Pre-torque selection	0: Pre-torque invalid 1: Load cell pre-torque compensation 2: Automatic pre-torque compensation	0	-	★	225
F8-02	Pre-torque offset	0.0–100.0	50.0	%	★	225
F8-03	Drive gain	0.00–2.00	0.60	-	★	226
F8-04	Brake gain	0.00–2.00	0.60	-	★	226
F8-05	Current car load	0–1023	0	-	●	225
F8-06	Car no-load load	0–1023	0	-	★	225
F8-07	Car full-load load	0–1023	100	-	★	225
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	-	☆	226
F8-09	Emergency evacuation operation speed at power failure	0.000 to F3-11	0.050	m/s	★	193, 219
F8-10	Emergency evacuation operation mode at power failure	0: Motor not running 1: UPS 2: 48 V battery power supply	0	-	★	219
F8-11	Brake apply delay	0.200–1.500	0.600s	s	★	201
F8-12	Fire emergency floor 2	0 to F6-00	0	-	★	221
F8-14	HCB communication rate	Bit0 = 0: HCB communication baud rate 9600 bps Bit0 = 1: HCB communication baud rate 38400 bps Bit4: Energy saving of HCB communication	0	-	☆	227

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Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
F8-16	Start address of hall call auxiliary command	0–40	0	-	☆	227
F8-17	Hall call address check	0–1	0	-	☆	227
Group F9: Time parameters						
F9-00	Idle time before returning to base floor	0–240	10	min	☆	217
F9-01	Time for fan and lamp to be turned off	0–240	2	min	☆	227
F9-02	Motor running time limit	0–45	45	s	★	228
F9-03	Clock: year	2000–2100	Current year	YYYY	☆	228
F9-04	Clock: month	1–12	Current month	MM	☆	228
F9-05	Clock: day	1–31	Current day	DD	☆	228
F9-06	Clock: hour	0–23	Current hour	HH	☆	228
F9-07	Clock: minute	0–59	Current minute	MM	☆	228
F9-09	Accumulative running time	0–65535	0	h	●	228
F9-11	High byte of running times	0–9999	0	-	●	228
F9-12	Low byte or running times	0–9999	0	-	●	228
F9-13	Maintenance notification period	0–99	0	day	★	228
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	-	☆	244
FA-01	Display in running state	1–65535	65535	-	☆	229
FA-02	Display in stop state	1–65535	65535	-	☆	230
FA-03	Current encoder angle	0.0–359.9	0.0	Degree (°)	●	243
FA-05	MCB board software	0–65535	0	-	●	243
FA-06	Drive board software	0–65535	0	-	●	243
FA-07	Heatsink temperature	0–100	0	°C	●	243

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
FA-11	Pre-torque current	0.0–200.0	0	%	●	243
FA-12	Logic information	0–65535	0	-	●	234
FA-13	Curve information	0–65535	0	-	●	235
FA-14	Set speed	0.000–4.000	0	m/s	●	243
FA-15	Feedback speed	0.000–4.000	0	m/s	●	243
FA-16	Bus voltage	0–999.9	0	V	●	243
FA-17	Present position	0.00–300.0	0	m	●	243
FA-18	Output current	0.0–999.9	0	A	●	243
FA-19	Output frequency	0.00–99.99	0	Hz	●	243
FA-20	Torque current	0.0–999.9	0	A	●	243
FA-21	Output voltage	0–999.9	0	V	●	243
FA-22	Output torque	0–100	0	%	●	243
FA-23	Output power	0.00–99.99	0	kW	●	243
FA-24	Communication interference	0–65535	0	-	●	212
FA-26	Input state 1	0–65535	0	-	●	235
FA-27	Input state 2	0–65535	0	-	●	235
FA-28	Input state 3	0–65535	0	-	●	235
FA-30	Input state 5	0–65535	0	-	●	235
FA-31	Output state 1	0–65535	0	-	●	235
FA-32	Output state 2	0–65535	0	-	●	235
FA-33	Car input state	0–65535	0	-	●	239
FA-34	Car output state	0–65535	0	-	●	239
FA-35	Hall sate	0–65535	0	-	●	241
FA-36	System state 1	0–65535	0	-	●	241
FA-37	System state 2	0–65535	0	-	●	241
FA-46	Hall call communication state 1	0–65535 (floors 1–16)	0	-	●	210
FA-47	Hall call communication state 2	0–65535 (floors 17–32)	0	-	●	210
FA-48	Hall call communication state 3	0–65535 (floors 33–40)	0	-	●	210
Group Fb: Door function parameters						
Fb-00	Number of door machine(s)	1–2	1	-	★	244
Fb-01	CTB software	00–999	0	-	●	243
Fb-02	Door machine 1 service floors 1 (floors 1–16)	0–65535	65535	-	☆	215

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
Fb-03	Door machine 1 service floors 2 (floors 17–32)	0–65535	65535	-	☆	215
Fb-04	Door machine 2 service floors 1 (floors 1–16)	0–65535	65535	-	☆	216
Fb-05	Door machine 2 service floors 2 (floors 17–32)	0–65535	65535	-	☆	216
Fb-06	Door open protection time	5–99	10	s	☆	244
Fb-07	Arrival gong output delay	0–1000	0	ms	☆	244
Fb-08	Door close protection time	5–99	15	s	☆	244
Fb-09	Door open/close protection times	0–20	0	-	☆	245
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	-	☆	245
Fb-11	Door open holding time for hall call	1–1000	5	s	☆	245
Fb-12	Door open holding time for car call	1–1000	3	s	☆	245
Fb-13	Door open holding time at base floor	1–1000	10	s	☆	245
Fb-14	Door open delay	10–1000	30	s	☆	245
Fb-15	Special door open holding time	10–1000	30	s	☆	246
Fb-16	Manual door open holding time	1–60	5	s	☆	246
Fb-17	Holding time for forced door close	5–180	120	s	☆	246
Fb-18	Door machine 1 service floors 3 (floors 33–40)	0–65535	65535	-	☆	216
Fb-19	Door machine 2 service floors 3 (floors 33–40)	0–65535	65535	-	☆	216

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
Group FC: Protection function parameters						
FC-00	Program control for protection function	Bit0: Short circuit to ground detection at power-on Bit2: Decelerating to stop at valid light curtain Bit9: Mode without door open/close limit Bit10: Light-load input	0	-	★	246
FC-01	Program control 2 for protection function	Bit0: Overload protection Bit1: Canceling protection at output phase loss Bit2: Canceling over-modulation function Bit4: Light curtain judgment at door close limit Bit5: Canceling SPI communication judgment Bit14: Canceling protection at input phase loss	65	-	★	246
FC-02	Overload protection coefficient	0.50–10.00	1.00	-	★	246
FC-03	Overload pre-warning coefficient	50–100	80	%	★	246
FC-04	Opposite door selection	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	0	-	★	246
FC-06	Designated fault	0–99	0	-	☆	244
FC-07	Designated fault code	0–9999	0	-	●	247
FC-08	Designated fault subcode	0–65535	0	-	●	247
FC-09	Designated fault month and day	0–1231	0	MM.DD	●	247
FC-10	Designated fault hour and minute	0–23.59	0	HH.MM	●	247
FC-11	Logic information of designated fault	0–65535	0	-	●	247
FC-12	Curve information of designated fault	0–65535	0	-	●	247
FC-13	Set speed upon designated fault	0.000–4.000	0	m/s	●	247
FC-14	Feedback speed upon designated fault	0.000–4.000	0	m/s	●	247

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
FC-15	Bus voltage upon designated fault	0.0–999.9	0	v	●	247
FC-16	Current position upon designated fault	0.0–300.0	0	m	●	247
FC-17	Output current upon designated fault	0.0–999.9	0	A	●	247
FC-18	Output frequency upon designated fault	0.00–99.99	0	Hz	●	247
FC-19	Torque current upon designated fault	0.0–999.9	0	A	●	247
FC-20	1st fault code	0–9999	0	-	●	247
FC-21	1st fault subcode	0–65535	0	-	●	247
FC-22	1st fault month and day	0–1231	0	MM.DD	●	247
FC-23	1st fault hour and minute	0–23.59	0	HH.MM	●	247
FC-24	2nd fault code	0–9999	0	-	●	247
FC-25	2nd fault subcode	0–65535	0	-	●	247
FC-26	2nd fault month and day	0–1231	0	MM.DD	●	248
FC-27	2nd fault hour and minute	0–23.59	0	HH.MM	●	248
FC-28	3rd fault code	0–9999	0	-	●	248
FC-29	3rd fault subcode	0–65535	0	-	●	248
FC-30	3rd fault month and day	0–1231	0	MM.DD	●	248
FC-31	3rd fault hour and minute	0–23.59	0	HH.MM	●	248
FC-32	4th fault code	0–9999	0	-	●	248
FC-33	4th fault subcode	0–65535	0	-	●	248
FC-34	4th fault month and day	0–1231	0	MM.DD	●	248
FC-35	4th fault hour and minute	0–23.59	0	HH.MM	●	248
…						
FC-56	10th fault code	0–9999	0	-	●	248
FC-57	10th fault subcode	0–65535	0	-	●	248
FC-58	10th fault month and day	0–1231	0	MM.DD	●	248
FC-59	10th fault hour and minute	0–23.59	0	HH.MM	●	248
FC-60	Latest fault code	0–9999	0	-	●	248
FC-61	Latest fault subcode	0–65535	0	-	●	248

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
FC-62	Latest fault month and day	0–1231	0	MM.DD	●	248
FC-63	Latest fault hour and minute	0–23.59	0	HH.MM	●	248
FC-64	Logic information of latest fault	0–65535	0	-	●	248
FC-65	Curve information of latest fault	0–65535	0	-	●	248
FC-66	Set speed upon latest fault	0.000–4.000	0	m/s	●	248
FC-67	Feedback speed upon latest fault	0.000–4.000	0	m/s	●	248
FC-68	Bus voltage upon latest fault	0.0–999.9	0	v	●	248
FC-69	Current position upon latest fault	0.0–300.0	0	m	●	248
FC-70	Output current upon latest fault	0–999.9	0	A	●	248
FC-71	Output frequency upon latest fault	0.00–99.99	0	Hz	●	248
FC-72	Torque current upon latest fault	0.0–999.9	0	A	●	248
Group Fd: Communication parameters						
Fd-00	Baud rate	0: 9600 1: 38400	0	bit/s	★	249
Fd-02	Local address	0–127 0: Broadcast address	1	-	★	249
Fd-03	Communication response delay	0–20	10	ms	★	249
Fd-04	Communication timeout	0.0–60.0	0.0	s	★	249
Fd-05	Re-leveling stop delay	0.00–2.00	0.00	s	★	249
Fd-07	HCB:JP1 input	0: Reserved 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	-	★	223
Fd-08	HCB:JP2 input		2	-	★	223

Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
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	-	★	250
Fd-10	HCB:JP2 output		2	-	★	250
Fd-11	HCB-B:JP1 input	0: Reserved NO/NC input: 1/33: Light-load signal 2/34: Half-load signal 3/35: Door 2 selection 4/36: Door 2 restricted (back door forbidden) 5/37: Door 1 safety edge 6/38: Door 2 safety edge 7/39: Single/Double door selection	0	-	★	250
Fd-12	HCB-B:JP2 input		0	-	★	250
Fd-13	HCB-B:JP3 input		0	-	★	250
Fd-14	HCB-B:JP4 input		0	-	★	250
Fd-15	HCB-B:JP5 input		0	-	★	250
Fd-16	HCB-B:JP6 input		0	-	★	250
Fd-17	HCB-B:A1 output	0: Reserved 1: Fault output 2: Non-door zone stop output 3: Non-service state output 4: Fire emergency output 5: Power failure emergency output 6: Door lock valid 7: Night output signal	0	-	★	250
Fd-18	HCB-B:A2 output		0	-	★	250
Fd-19	HCB-B:B1 output		0	-	★	250
Fd-20	HCB-B:B2 output		0	-	★	250
Fd-21	HCB-B:C1 output		0	-	★	250
Fd-22	HCB-B:C2 output		0	-	★	250
Fd-23	HCB-B:C3 output		0	-	★	
Fd-24	HCB-B:C4 output		0	-	★	250
Fd-25	HCB-B:C5 output		0	-	★	250
Fd-26	HCB-B:C6 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	-	★	216
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. 00: Display "0" 01: Display "1" 02: Display "2" 03: Display "3" 04: Display "4" (To be continued)	1901	-	☆	251
FE-02	Floor 2 display		1902	-	☆	251

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Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
FE-03	Floor 3 display	05: Display "5"	1903	-	☆	251
FE-04	Floor 4 display	06: Display "6"	1904	-	☆	251
FE-05	Floor 5 display	07: Display "7"	1905	-	☆	251
FE-06	Floor 6 display	08: Display "8"	1906	-	☆	251
FE-07	Floor 7 display	09: Display "9"	1907	-	☆	251
FE-08	Floor 8 display	10: Display "A"	1908	-	☆	251
FE-09	Floor 9 display	11: Display "B"	1909	-	☆	251
FE-10	Floor 10 display	12: Display "G"	0100	-	☆	251
FE-11	Floor 11 display	13: Display "H"	0101	-	☆	251
FE-12	Floor 12 display	14: Display "L"	0102	-	☆	251
FE-13	Floor 13 display	15: Display "M"	0103	-	☆	251
FE-14	Floor 14 display	16: Display "P"	0104	-	☆	251
FE-15	Floor 15 display	17: Display "R"	0105		☆	251
Floor 16 to floor 30 display		18: Display "-"				251
FE-31	Floor 31 display	19: No display	0301	-	☆	251
FE-35	Floor 32 display	20: Display "12"	0302	-	☆	251
FE-36	Floor 33 display	21: Display "13"	0303	-	☆	251
FE-37	Floor 34 display	22: Display "23"	0304	-	☆	251
FE-38	Floor 35 display	23: Display "C"	0305	-	☆	251
FE-39	Floor 36 display	24: Display "D"	0306	-	☆	251
FE-40	Floor 37 display	25: Display "E"	0307	-	☆	251
FE-41	Floor 38 display	26: Display "F"	0308	-	☆	251
FE-42	Floor 39 display	27: Display "I"	0309	-	☆	251
FE-43	Floor 40 display	28: Display "J"	0400	-	☆	251
FE-52	Highest digit selection 1	29: Display "K" 30: Display "N"	0	-	☆	251
FE-53	Highest digit selection 2	31: Display "O" 32: Display "Q"	0	-	☆	251
FE-54	Highest digit selection 3	33: Display "S"	0	-	☆	251
FE-55	Highest digit selection 4	34: Display "T" 35: Display "U"	0	-	☆	251
FE-56	Highest digit selection 5	36: Display "V" 37: Display "W" 38: Display "X" 39: Display "Y" 40: Display "Z" 41: Display "15" 42: Display "17" 43: Display "19"	0	-	☆	251

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Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
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: Hall call deletion	34816	-	☆	262
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 Bit8: NO/NC output selection of shorting motor stator contactor Bit9: Immediate stop upon re-leveling Bit13: High-speed elevator protection function Bit15: Opposite door independent control	36	-	☆	263
Group Fr: Leveling adjustment parameters						
Fr-00	Leveling adjustment function	0: Disabled 1: Enabled	0	-	★	252
Fr-01	Leveling adjustment record 1	00000–60060	30030	mm	★	252
Fr-02	Leveling adjustment record 2		30030	mm	★	252
…			…			
Fr-20	Leveling adjustment record 20		30030	mm	★	252
Group FF: Factory parameters						
Group FP: User parameters						
FP-00	User password	0–65535	0	-	☆	254

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Function Code	Parameter Name	Setting Range	Default	Unit	Property	Page
FP-01	Parameter update	0: No operation 1: Restore default setting (except group F1) 2: Clear fault records	0	-	★	254
FP-02	User-defined parameter display	0: Invalid 1: Valid	0	-	★	254
FP-05	Contract No. 2	0–65535	0	-	☆	255
FP-06	Contract No. 1	0–65535	5555	-	★	255

8

Description of Function Codes

Chapter 8 Description of Function Codes

8.1 Basic Elevator Parameters

8.1.1 Motor Control Mode

Function Code	Parameter 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	Description	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

8.1.2 Command Source Selection

Function Code	Parameter 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.

Value	Command Source	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/RES on the operation panel, and the running speed is set by F0-02 (Running speed under operation panel control)

Value	Command Source	Working Mode		Purpose	Remarks
		X Input	Y Output		
1	Distance control	Detect X input signals	Output	Used during normal elevator running	During inspection, the elevator runs at the speed set in F3-11. 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 target floor within the rated elevator speed, implementing direct travel ride.

8.1.3 Speed Setting

Function Code	Parameter 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	0.250–4.000	1.600	m/s	★
F3-10	Re-leveling speed	0.000–0.080	0.040	m/s	★
F3-11	Inspection speed	0.100–0.630	0.250	m/s	★
F3-21	Low-speed re-leveling speed	0.080 to F3-11	0.100	m/s	★
F6-48	Emergency evacuation switching speed	0.010–0.630	0.010	m/s	★
F8-09	Emergency evacuation speed	0.000 to F3-11	0.050	m/s	★

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

  Note that this function is enabled only when F0-01 is set to 0 (Operation panel control).

- 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 norminal rated speed of the elevator. The value of this parameter is dependent on the elevator mechanism and traction motor.

- 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).

- F3-11 is used to set the elevator speed during inspection and shaft auto-tuning.

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

- F6-48 is used to set the switching speed at shorting stator braking mode switched over to controller drive via speed setting.

- F8-09 is used to set the speed for emergency evacuation operation at power failure.

8.1.4 Rated Elevator Load Setting

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

It is used to set the rated elevator load. This parameter is used for the anti-nuisance function.

8.1.5 Frequency Setting

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F0-06	Maximum frequency	20.00–99.00	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.

8.1.6 Reduction of Motor Noise and EMI

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F0-07	Carrier frequency	0.5–16.0	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:

- 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.

Table 8-1 Influences of carrier frequency adjustment

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

8.2 Motor Parameters

8.2.1 Motor Type and Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F1-25	Motor type	0: Asynchronous motor 1: Synchronous motor	1	-	★
F1-01	Rated motor power	0.7–75.0	Model dependent	kW	★
F1-02	Rated motor voltage	0–600	Model dependent	V	★
F1-03	Rated motor current	0.00–655.00	Model dependent	A	★
F1-04	Rated motor frequency	0.00–99.00	Model dependent	Hz	★
F1-05	Rated motor speed	0–3000	Model dependent	RPM	★

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

8.2.2 Encoder Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F1-00	Encoder type	0: SIN/COS encoder 1: UVW encoder 2: ABZ incremental encoder 3: ECN413/1313 absolute encoder	0	-	★
F1-10	Encoder verification selection	0–65535	0	-	★
F1-12	Encoder pulses per revolution	0–10000	2048	PPR	★

- 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.

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

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

8.2.3 Motor Auto-tuning Mode

Function Code	Parameter 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	0	-	★

It is used to select the auto-tuning mode.

For details, see section 6.1.3.

8.2.4 Auto-tuning Parameters for Asynchronous Motor

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F1-14	Stator resistance	0.000–30.000	Model dependent	Ω	★
F1-15	Rotor resistance	0.000–30.000	Model dependent	Ω	★
F1-16	Leakage inductance	0.00–300.00	Model dependent	mH	★
F1-17	Mutual inductance	0.1–3000.0	Model dependent	mH	★
F1-18	Magnetizing current	0.01–300.00	Model dependent	A	★

These parameters are obtained by means of 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 onsite, 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.

8.2.5 Auto-tuning Parameters for Synchronous Motor

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F1-06	Encoder initial angle	0.0–359.9	0	Degree (°)	★
F1-07	Encoder angle at power-off	0.0–359.9	0	Degree (°)	★
F1-08	Synchronous motor wiring mode	0–15	0	-	★
F1-19	Shaft Q inductance (torque)	0.00–650.00	3.00	mH	★
F1-20	Shaft D inductance (excitation)	0.00–650.00	3.00	mH	★
F1-21	Back EMF	0–65535	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.

8.2.6 Other Motor Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F1-09	Current filter time (synchronous motor)	0–3	0	-	★
F1-13	Encoder wire-breaking detection time	0–10.0	1.0	s	★

F1-09 is used to set the current filter time, which suppress the periodic vertical jitter. Increase the value in ascending order of 0.5 to achieve the optimum effect.

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.

8.3 Vector Control Parameters

8.3.1 Speed Loop PI Parameters

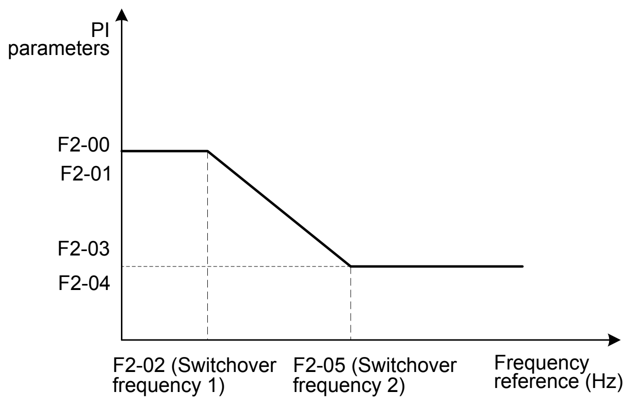
Function Code	Parameter Name	Setting Range	Default	Unit	Property
F2-00	Speed loop proportional gain Kp1	0–100	40	-	★
F2-01	Speed loop integral time Ti1	0.01–10.00	0.60	s	★
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	★
F2-03	Speed loop proportional gain Kp2	0–100	35	-	★
F2-04	Speed loop integral time Ti2	0.01–10.00	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 8-1.

Figure 8-1 Relationship between running frequencies and PI parameters



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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.

8.3.2 Current Loop PI Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F2-06	Current loop Kp1 (torque)	10–500	60	-	★
F2-07	Current loop Kp1 (torque)	10–500	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.

8.3.3 Position Lock PI Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F2-11	Position lock current coefficient	0.20–50.0	15	-	★
F2-12	Position lock speed loop Kp	0.00–2.00	0.5	-	★
F2-13	Position lock speed loop Ki	0.00–2.00	0.6	-	★

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 (Pre-torque selection) is set to 2 (Automatic pre-torque compensation).

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. For details, see the description of section 6.1.6.

8.3.4 Torque Acceleration/Deceleration Time Setting

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

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

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

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

8.3.5 Other Vector Control Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F2-08	Torque upper limit	0.0–200.0	150.0	%	★

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

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F2-10	Elevator running direction	0–1	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 consistent with the inspection command direction.

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

8.4 Running Control Parameters

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8.4.1 Running Speed Curve Setting

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F2-18	Startup acceleration time	0.000–1.500	0.000	s	★
F3-00	Startup speed	0.000–0.030	0.000	m/s	★
F3-01	Startup holding time	0.000–0.500	0.000	s	★
F3-02	Acceleration rate	0.200–1.500	0.600	m/s^2	★
F3-03	Acceleration start jerk time	0.300–4.000	2.500	s	★
F3-04	Acceleration end jerk time	0.300–4.000	2.500	s	★
F3-05	Deceleration rate	0.200–1.500	0.600	m/s^2	★
F3-06	Deceleration end jerk time	0.300–4.000	2.500	s	★
F3-07	Deceleration start jerk time	0.300–4.000	2.500	s	★
F3-09	Pre-deceleration distance	0–90.0	0.0	mm	★

Figure 8-2 Running speed curve

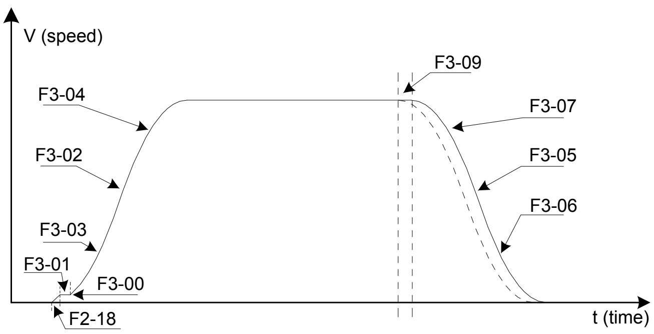
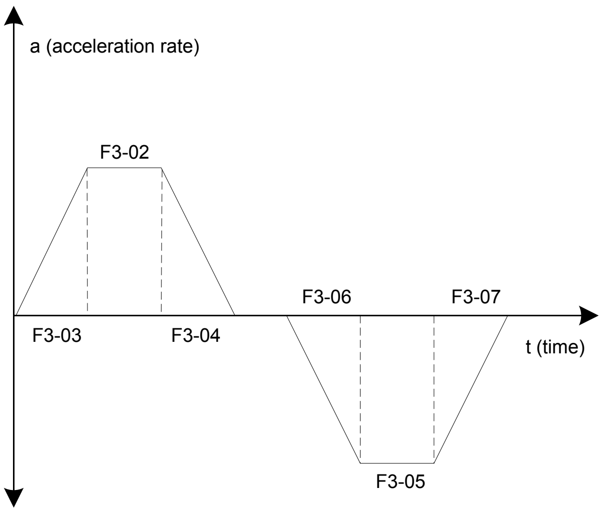


Figure 8-3 Acceleration rate curve



1. F2-18, F3-00, and F3-01 are used to set the acceleration time and holding time of the startup speed.

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

2. F3-02, F3-03, and F3-04 are used to set the running curve during acceleration of the elevator.

   - 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.

3. F3-05, F3-06, and F3-07 are used to set the running curve during deceleration of the elevator.

   - F3-05 is the acceleration rate of the elevator speed curve (uniform deceleration segment) .
   - F3-06 is the time for the rate to increase from 0 to the value set in F3-05 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 decrease from the value set in F3-05 to 0 in the speed curve (start jerk segment). The larger the value is, the smoother the jerk is.

4. It is used to set the pre-deceleration distance of the elevator in distance control, as shown in Figure 8-2. This function is to eliminate the effect of encoder signal loss or leveling signal delay.

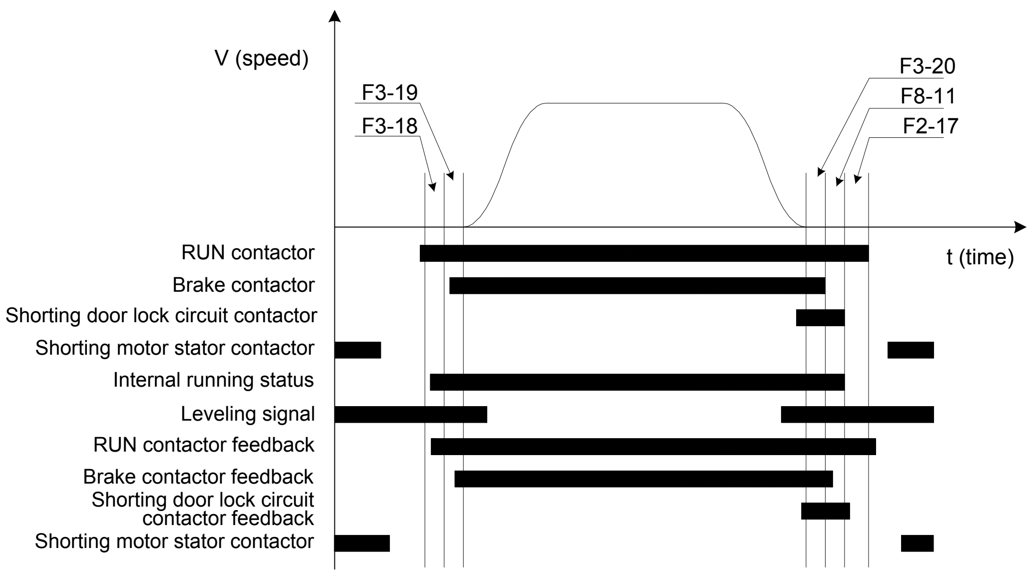
8.4.2 Startup/Stop Running Sequence

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F3-18	Zero-speed control time at startup	0.000–1.000	0.200	s	★
F3-19	Brake release delay	0.000–2.000	0.600	s	★
F3-20	Zero-speed control time at end	0.000–1.000	0.300	s	★
F8-11	Brake apply delay	0.200–1.500	0.600s	s	★

These parameters 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 0completely 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.
- F8-11 (Brake apply delay) specifies the time from the moment when the system sends the brake apply command to the moment when the brake is completely applied, during which the system retains the zero-speed torque current output.

Figure 8-4 Running time sequence



8.4.3 Slip Experiment

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F3-24	Slip experiment function	0: Disabled 1: Enabled	1000	kg	★

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, restore the parameter to disable the function.

8.5 Shaft Switch, Floor, and Position Parameters

8.5.1 Shaft Slow-down and Special Deceleration Rate

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F3-12	Position of up slow-down 1	0.000–300.00	0.00	m	★
F3-13	Position of down slow-down 1	0.000–300.00	0.00	m	★
F3-14	Position of up slow-down 2	0.000–300.00	0.00	m	★
F3-15	Position of down slow-down 2	0.000–300.00	0.00	m	★
F3-16	Position of up slow-down 3	0.000–300.00	0.00	m	★
F3-17	Position of down slow-down 3	0.000–300.00	0.00	m	★
F3-08	Special deceleration rate	0.200–1.500	0.900	m/s^2	★

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 slow-down switches, see the description of section 3.4.2.

The NICE3000new 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.

F3-08 is used to set the deceleration rate in elevator slow-down, inspection, and shaft auto-tuning.

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.

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.

8.5.2 Current Position Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F4-01	Current floor	F6-01 to F6-00	1	-	★
F4-02	High byte of current floor position	0–65535	1	Pulses	●
F4-03	Low byte of current floor position	0–65535	34464	Pulses	●

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.

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 NICE3000new 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.

8.5.3 Leveling Plate Length Parameters

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

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

F4-05 indicates the pulses corresponding to the distance between the up and down leveling sensors.

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

For the relationship between the two parameters, see section 3.4.

8.5.4 Floor Height Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F4-06	High byte of floor height 1	0–65535	0	Pulses	★
F4-07	Low byte of floor height 1	0–65535	0	Pulses	★
	…(Floor height 2 to floor height 38)				
F4-82	High byte of floor height 39	0–65535	0	Pulses	★
F4-83	Low byte of floor height 39	0–65535	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.

8.6 Terminal Function Selection

The NICE3000new provides 24 low-voltage DIs (X1 to X24), 3 higher-voltage DIs (X25 to X27), and 1 AI. All low-voltage inputs share the COM terminal; when the 24 VDC voltage is applied, the corresponding input indicator becomes ON.

8.6.1 Function Selection of Low-Voltage DI Terminals

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-01	X1 function selection	0–199	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	-	★

These parameters are used to set the signals input to DI terminals X1 to X24.

A signal (except 0) must not allocated to DI terminals repeatedly. If a signal cannot be selected, view whether this signal has been allocated to another terminal or is being used.

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 sensor signal. The system supports three types of leveling configuration: single door zone sensor, up and down leveling sensors, and door zone sensor plus the up/down leveling sensor.

The following table describes the sequence of received signals for the three types of leveling configurations.

Leveling Configuration			Signal Receiving Sequence	
Up leveling sensor	Down leveling sensor	Door zone sensor	Up direction	Down direction
No	No	Yes	Door zone signal	
Yes	Yes	No	Up leveling signal --> Down leveling signal	Down leveling signal --> Up leveling signal
Yes	Yes	Yes	Up leveling signal --> Door zone signal --> Down leveling signal	Down leveling signal --> Door zone signal --> Up leveling signal

If the leveling signal is abnormal (stuck or unavailable), the system reports fault Err22.

04: Safety circuit feedback   05: Door lock circuit 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 up signal 10: Inspection down signal

When the Automatic/Inspection switch is set to the Inspection position, the elevator enters the inspection state; in this case, the system cancels all automatic running including the automatic door actions. When the inspection up signal or inspection down signal is valid, the elevator runs at the inspection speed.

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 stops at the nearest floor without opening the door, and then 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

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 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).

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. For more details, see section 5.2.1.

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.

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

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 used for allocation of elevators in parallel or group mode and judgment of the emergency running direction at power failure.

72: Fire emergency floor switchover signal

The NICE3000new 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.

76: Door 1 open input 77: Door 2 open input

8.6.2 Function Selection of Higher-Voltage DI Terminals

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-37	X25 function selection	0: Invalid 4: Safety circuit signal 5: Door lock circuit signal	0	-	★
F5-38	X26 function selection		0	-	★
F5-39	X27 function selection		0	-	★

These parameters are used to set signals input to heavy-current detection input terminals X25 to X27.

8.6.3 Function Selection of DO Terminals

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-26	Y1 function selection	0–31	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.

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00: Invalid

The terminal has no function.

01: RUN 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-Err36/Err37 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. For details, see section 6.2.1.

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.

8.6.4 Load Cell Channel Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-36	Load cell input selection	0–3	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

8.6.5 CTB Input Type Selection

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

It is used to define the input signal type (NO/NC) of the CTB by binary bit. Each bit of the function code defines a signal, as described in the following table.

If a bit is set to 1, the signal indicated by this bit is NO input; if this bit is set to 0, this signal is NC input. For details on how to view and set this function code, see the descriptions in section 8.21.1.

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	Bit5	Door 2 close limit	0
Bit1	Door 2 light curtain	0	Bit6	Full-load signal (digital)	1
Bit2	Door 1 open limit	0	Bit7	Overload signal (digital)	0
Bit3	Door 2 open limit	0	Bit8	Light-load signal (digital)	1
Bit4	Door 1 close limit	0	0: NC input; 1: NO input		

8.7 Communication and Terminal State Display

8.7.1 MCB Communication State Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-32	Communication state display	-	-	-	●

It is used to monitor the state of CANbus communication with the CTB and Modbus communication with

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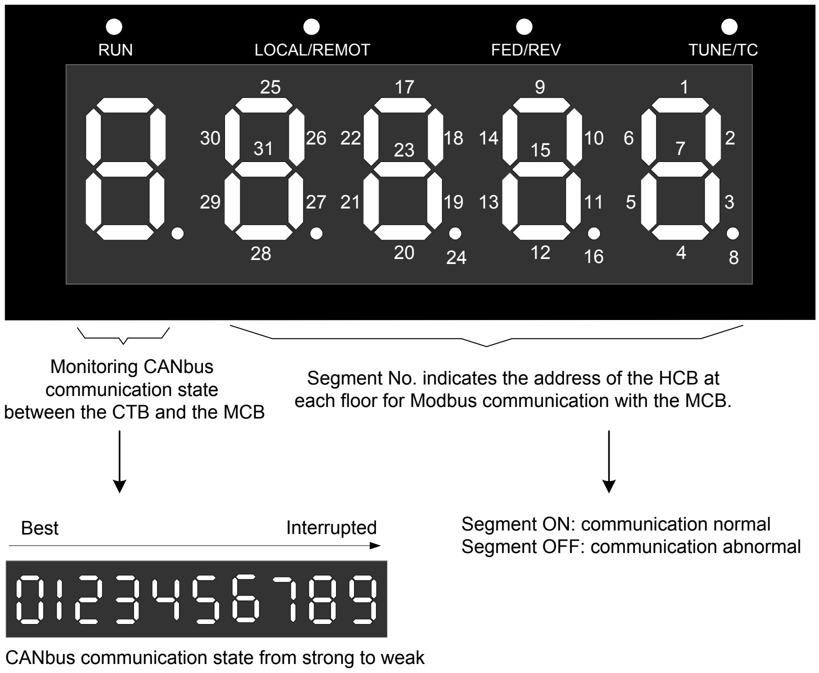
the HCB.

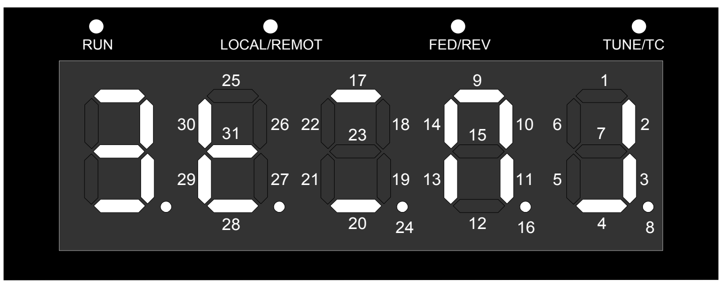
When you enter the menu of F5-32, the LEDs on the operation panel indicate the current HCB communication state.

Figure 8-5 F5-32 communication state monitoring



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 normal communication.

Figure 8-6 Example of LED display indicating the communication state



8.7.2 HCB Communication State Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-46	HCB communication state 1	0–65535	0	-	●
FA-47	HCB communication state 2	0–65535	0	-	●
FA-48	HCB communication state 3	0–65535	0	-	●

These parameters display the communication state between HCBs of all floors and the MCB.

FA-46, FA-47, and FA-48 respectively indicate the communication state of floors 1 to 16, 17 to 32, and 33 to 40.

Figure 8-7 FA-46 HCB communication state 1

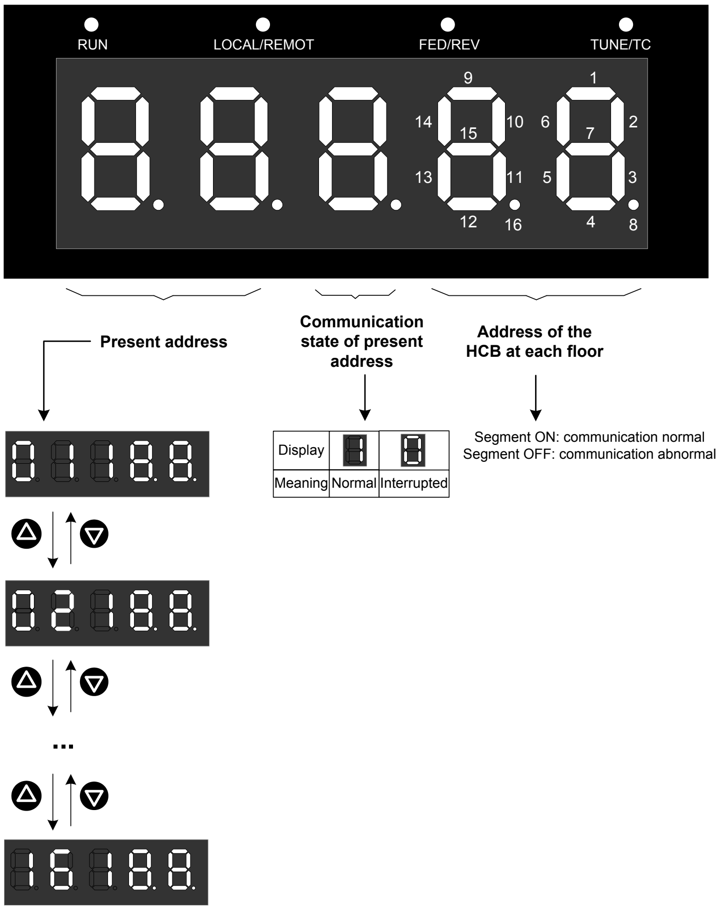


Figure 8-8 FA-47 HCB communication state 2

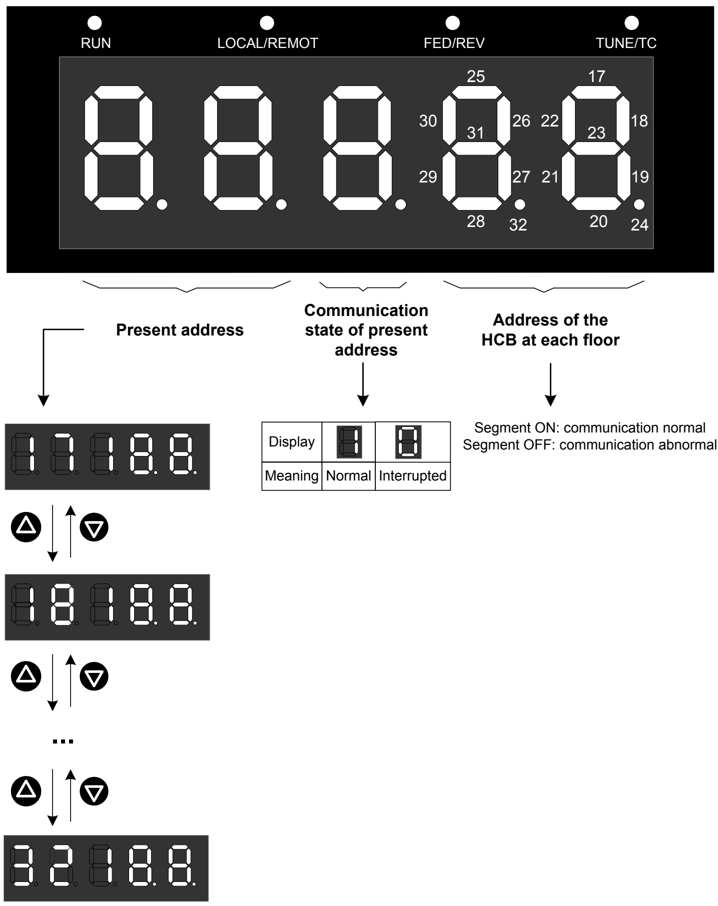
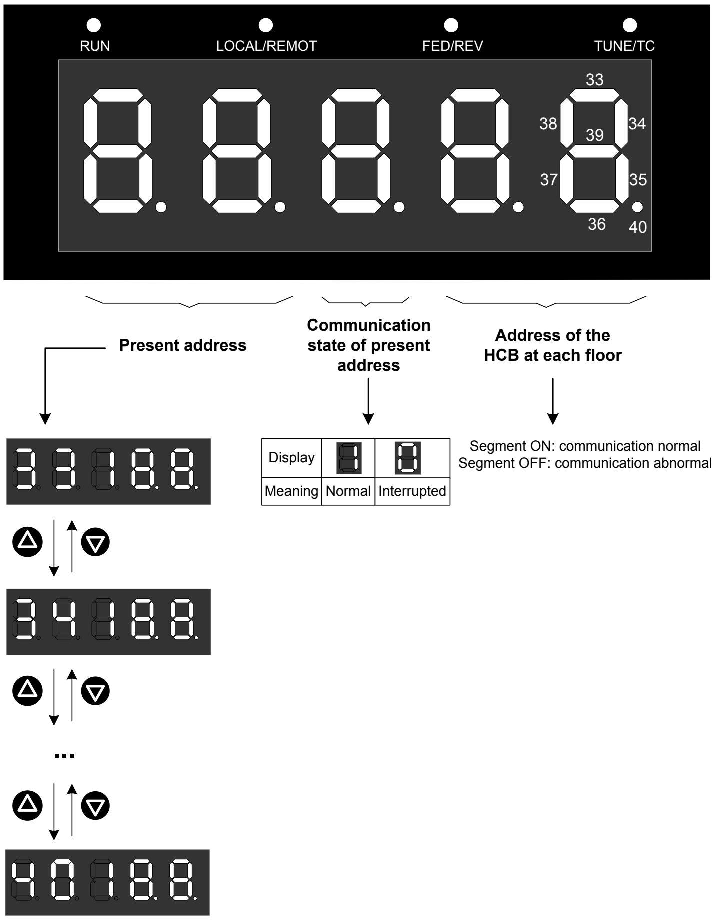


Figure 8-9 FA-48 HCB communication state 3

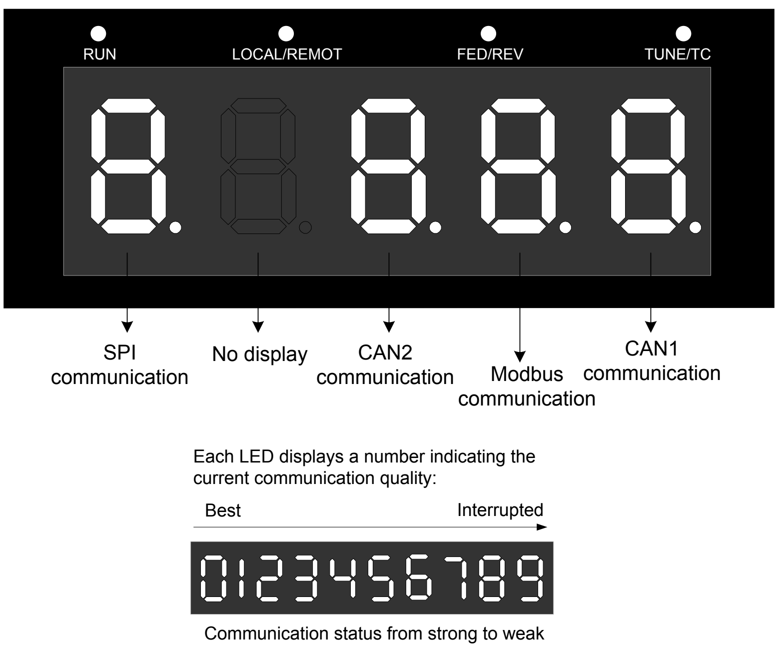


8.7.3 Communication Interference Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-24	Communication interference	0–65535	0	-	●

It displays the current communication quality of the system, as described in the following figure.

Figure 8-10 FA-24 communication interference display



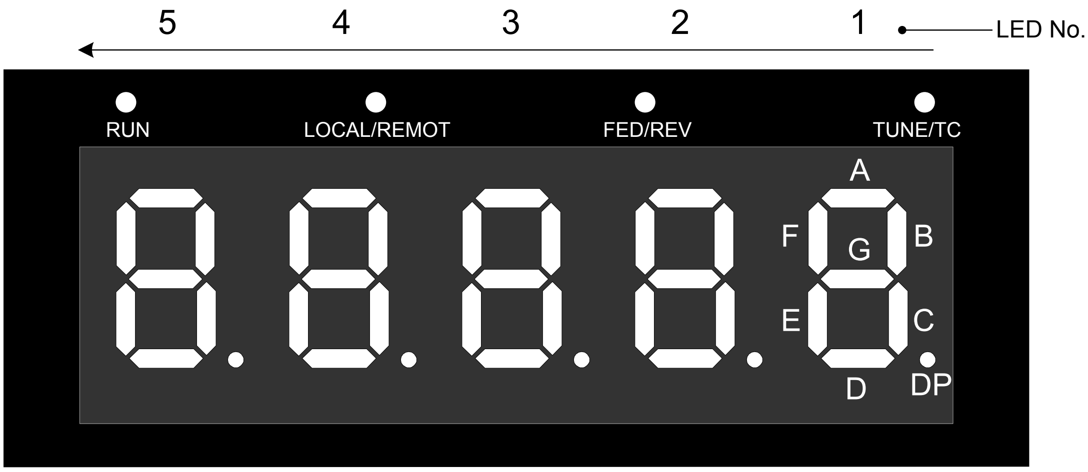
8.7.4 Terminal State Display

Function Code	Parameter 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 8-11 Monitoring of all I/O terminals



Note:
1. Segments of LEDs 2 to 5 are marked in the same way as those of LED 1.

2. Segment ON: signal active
Segment OFF: signal inactive

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 1 open output	Non-door zone stop	Hall call fire emergency input
E	Door 1 close limit	Attendant signal	Door 2close 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	-

8.8 Normal Running Function Parameters

8.8.1 Top/Bottom Floor Setting

Function Code	Parameter 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	-	★

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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.

8.8.2 Service Floor Setting

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-05	Service floors 1 (floors 1–16)	0–65535	65535	-	★
F6-06	Service floors 2 (floors 17–32)	0–65535	65535	-	★
F6-35	Service floors 3 (floors 33–40)	0–65535	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.

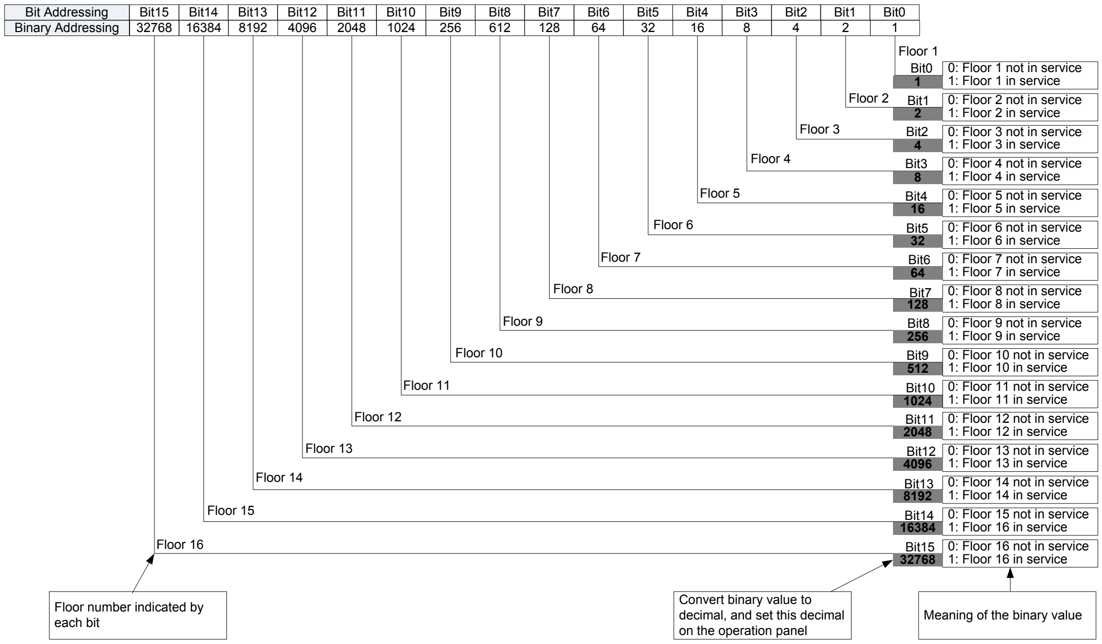
These parameters are set in the similar way.

The following part takes F6-05 as an example to describe how to set the service floors.

F6-05 is enabled through bit addressing.

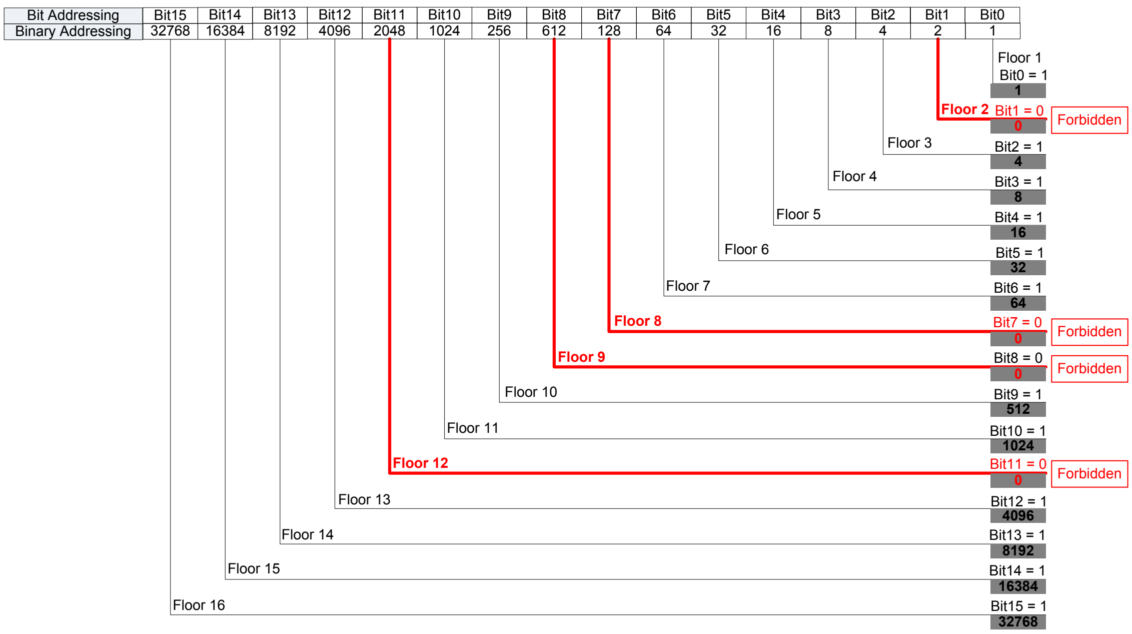
The 16 bits of the function code respectively correspond to 16 floors. If a bit is set to 1, the elevator will respond to calls of this floor; if this bit is set to 0, the elevator will not respond to calls of this floor.

Figure 8-12 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.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-02	Door machine 1 service floors 1 (floors 1–16)	0–65535	65535	-	☆
Fb-03	Door machine 1 service floors 2 (floors 17–32)	0–65535	65535	-	☆

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Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-18	Door machine 1 service floors 3 (floors 33–40)	0–65535	65535	-	☆
Fb-04	Door machine 2 service floors 1 (floors 1–16)	0–65535	65535	-	☆
Fb-05	Door machine 2 service floors 2 (floors 17–32)	0–65535	65535	-	☆
Fb-19	Door machine 2 service floors 3 (floors 33–40)	0–65535	65535	-	☆

These parameters are used to set the service floors of door machine 1 and door machine 2.

The setting method is the same as that for F6-05.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-32	Elevator function selection 1	Bit8: Time-based floor service	0	-	☆
F6-18	Start time of time-based floor service 1	00.00–23.59	00.00	HH.MM	☆
F6-19	End time of time-based floor service 1	00.00–23.59	00.00	HH.MM	☆
F6-20	Service floor 1 of time-based floor service 1	0–65535	65535	-	☆
F6-21	Service floor 2 of time-based floor service 1	0–65535	65535	-	☆
F6-36	Service floor 3 of time-based floor service 1	0–65535	65535	-	☆
F6-22	Start time of time-based floor service 2	00.00–23.59	00.00	HH.MM	☆
F6-23	End time of time-based floor service 2	00.00–23.59	00.00	HH.MM	☆
F6-24	Service floor 1 of time-based floor service 2	0–65535	65535	-	☆
F6-25	Service floor 2 of time-based floor service 2	0–65535	65535	-	☆
F6-37	Service floor 3 of time-based floor service 2	0–65535	65535	-	☆

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.

Service floor 1 corresponds to floors 1–16, service floor 2 corresponds to floors 17–32, and service floor 3 corresponds to floors 33–30.

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 F5-35.

The setting of time-based service floors is the same as that of service floors in F6-05.

8.8.3 Collective Selective Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-00	Collective selective mode	0–2	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	Parameter Name	Setting Range	Default	Unit	Property
FE-32	Elevator function selection 1	Bit6: Down collective selective peak service	0	-	☆
F6-14	Start time of down collective selective 1	00.00–23.59	00.00	HH.MM	☆
F6-15	End time of down collective selective 1	00.00–23.59	00.00	HH.MM	☆
F6-16	Start time of down collective selective 2	00.00–23.59	00.00	HH.MM	☆
F6-17	End time of down collective selective 2	00.00–23.59	00.00	HH.MM	☆

To enable the down collective selective peak service, set FE-32 Bit6 to 1.

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.

8.8.4 Setting for Returning to Parking Floor at Idle

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-02	Parking floor	F6-01 to F6-00	1	-	★
F9-00	Idle time before returning to base floor	0–240	10	min	☆

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.

8.8.5 Parallel/Group Control Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-07	Number of elevators in parallel/group mode	1–8	1	-	★
F6-08	Elevator No.	1–8	1	-	★
F6-09	Elevator program control	Bit0: Dispersed waiting Bit3: Parallel/Group control implemented at CAN2 Bit4: Group control in compatibility with NICE3000	0	-	★

F6-07 and F6-08 are used to set the number of elevators and elevator No. in parallel/group mode.

Bit0 to Bit4 of F6-09 are used to set different parallel/group control modes. For details, see section 6.2.3.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-32	Elevator function selection 1	Bit7: Parallel/Group control peak service	0	-	☆
F6-26	Peak 1 start time	00.00–23.59	00.00	HH.MM	☆
F6-27	Peak 1 end time	00.00–23.59	00.00	HH.MM	☆

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-28	Peak 1 floor	F6-01 to F6-00	1	-	★
F6-29	Peak 2 start time	00.00–23.59	00.00	HH.MM	☆
F6-30	Peak 2 end time	00.00–23.59	00.00	HH.MM	☆
F6-31	Peak 2 floor	F6-01 to F6-00	1	-	★

To enable the parallel/group control peak service, set FE-32 Bit7 to 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.

8.8.6 Attendant Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-00	Attendant/Automatic switchover time	3–200	3	s	★
F6-43	Attendant function selection	0–65535	0	-	★

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.

F6-43 is used to select the attendant-related elevator functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-43 are described in the following table.

Bit	Function	Description	Default
Bit0	Calls cancelled after entering attendant state	All car calls and hall calls are cancelled after the system enters the 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 state 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 the hall call floor and the car call floor are different, the buzzer tweets 2.5s at intervals.	0

Bit	Function	Description	Default
Bit6	Continuous buzzer tweeting in attendant state	When the hall call floor and the car call floor are different, the buzzer tweets continuously.	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.	0

8.8.7 Emergency Evacuation Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F8-09	Emergency evacuation operation speed at power failure	0.000 to F3-11	0.050	m/s	★
F3-22	Acceleration rate at emergency evacuation	0.100–1.300	0.100	m/s^2	★
F8-10	Emergency evacuation operation mode at power failure	0–2	0	-	★
F6-45	Emergency evacuation function selection	0–65535	0	-	★
F6-49	Emergency evacuation parking floor	0 to F6-00	0	-	★

F8-09 is used to set the speed for emergency evacuation operation at power failure.

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

F8-10 is used to set the emergency evacuation operation mode at power failure.

- 0: Motor not running
- 1: UPS
- 2: 48 V battery power supply

F6-45 is used to select the attendant-related elevator functions. Each bit of the function code defines a function, as described in the following table.

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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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

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>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 direction</td><td>0</td><td rowspan="2">Load direction determining (based on load cell data or half-load signal)</td><td>1</td><td rowspan="2">Direction of nearest landing floor</td><td>0</td></tr>
<tr><td>Bit1</td><td>0</td><td>1</td><td>0</td><td></td></tr>
<tr><td>Bit2</td><td>Stopping at evacuation parking 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>Reserved</td><td colspan="6">-</td><td>0</td></tr>
<tr><td>Bit4</td><td>Compensation at startup</td><td colspan="6">The non-load-cell startup is still valid in the process of evacuation running.</td><td>0</td></tr>
</table>

Bit	Function	Description	Default
Bit5	Reserved	-	0
Bit6	Reserved	-	0
Bit7	Reserved	-	0
Bit8	Emergency running time protection	If the elevator does not arrive at the required floor after 50s emergency evacuation running time, Err33 is reported. In this case, the function of switching over shorting stator braking mode to controller drive based on the time setting cannot be implemented.	0
Bit9	Reserved	-	0
Bit10	Emergency buzzer output	The buzzer tweets at intervals in the emergency evacuation running state.	0
Bit11	Reserved	-	0
Bit12	Shorting stator braking mode switched over to controller drive	It enables the function of switching over shorting stator braking mode to controller drive.	0
Bit13	Mode of shorting stator braking mode switched over to controller drive	0: Time setting If the time of the shorting stator braking mode exceeds 50s, the controller starts to drive the elevator. 1: Speed setting If the speed is still smaller than the value of F6-48 after 10s in the shorting stator braking mode, the controller starts to drive the elevator.	0
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 target floor. 1: The system exits emergency evacuation when receiving the door close limit signal from the elevator that arrives at the target floor.	0
Bit15	Shorting stator braking function	When this function is enabled (Bit15 = 1), the setting of related function codes becomes effective.	0

For details on the emergency evacuation function, see section 6.2.2.

8.8.8 VIP Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-12	VIP floor	0 to F6-00	0	-	★
F6-46	VIP function selection	0–65535	0	-	★

F6-12 is used to set the VIP floor.

F6-46 is used to select the elevator VIP function. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-46 are described in the following table.

Bit	Function	Description	Default
Bit0	VIP enabled by hall call at VIP floor	After this function is enabled, the system enters VIP running.	0

Bit	Function	Description	Default
Bit1	VIP enabled by terminal	After the terminal for VIP hall call becomes ON, the system enters VIP running.	0
Bit2 to Bit7	Reserved	-	0
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 section 6.1.5.

8.8.9 Leveling Sensor and Arrival Gong Time Setting

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-10	Leveling sensor filter time	10–50	14	ms	★
F6-47	Blinking advance time	0.0–15.0	0	s	☆

F6-10 indicates the delay time from the moment when the leveling sensor acts to the moment when the leveling signal becomes active. You need not modify it.

F6-47 is used to set the blinking advance time when the elevator arrives the floor required by the car call.

8.8.10 Other Normal Running Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-09	Elevator program control	0–65535	0	-	★
F6-11	Elevator function selection	0–65535	8448	-	★
F6-40	Program control selection 1	0–65535	0	-	★
F6-41	Program control selection 2	0–65535	0	-	★
F6-42	Program control selection 3	0–65535	0	-	★

For descriptions of these parameters, see section 8.21.

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8.9 Fire Emergency and Security Function Parameters

8.9.1 Fire Emergency Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-03	Fire emergency floor 1	F6-01 to F6-00	1	-	★
F8-12	Fire emergency floor 2	0 to F6-00	0	-	★
Fd-08	HCB:JP2 input	2/34: Fire emergency signal	2	-	★

After the fire emergency signal is active (input by means of the fire emergency key switch at hall or input terminal with signal 11/43), the elevator returns to the fire emergency floor without responding to any all, and waits at the floor.

The NICE3000new supports two fire emergency floors. The elevator stops at fire emergency floor 1 by default; if the DI with signal 72/104 (Fire emergency floor switchover signal) is ON, t he elevator stops at fire emergency floor 2.

After entering the fire emergency running state (fire emergency signal input by input terminal with signal

11/43 active), the elevator will not open or close the door automatically. You need to open or close the door by jog operation (optional) implemented on the door open or close button. In this state, the elevator responds only to car calls, and only one car call can be registered each time.

Other fire emergency-related functions are set in F6-44.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-44	Fire emergency function selection	0–65535	16456	-	★

F6-44 is used to select the fire emergency-related functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-44 are described in the following table.

Bit	Function	Description	Default
Bit0 to Bit2	Reserved	-	0
Bit3	Arrival gong output in inspection or fire emergency state	The arrival gong is output in the inspection or fire emergency state.	0
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.	0
Bit7	Reserved	-	0
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	-	0

Bit	Function	Description	Default
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.	0
Bit15	Automatic door open at fire emergency floor	The door opens automatically after the elevator arrives at the fire emergency floor.	0

8.9.2 Security Floor Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-32	Elevator function selection 1	Bit5: Night security floor function	0	-	☆
F6-13	Security floor	0 to F6-00	0	-	★
Fd-07	HCB:JP1 input	5/37: Security floor signal	0	-	★
Fd-08	HCB:JP2 input		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 target floor.

The elevator can be made to stop at the security floor in the following two ways:

- Fd-07/Fd-08 is set to 5/37 (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.

8.9.3 Elevator Lock Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-04	Elevator lock floor	F6-01 to F6-00	1	-	★
F6-40	Program control selection 1	Bit5: Timed elevator lock	0	-	★
F6-38	Elevator lock start time	00.00–23.59	00.00	HH.MM	☆
F6-39	Elevator lock end time	00.00–23.59	00.00	HH.MM	☆
Fd-07	HCB: JP1 input	1/33: Elevator lock signal	1	-	★

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.

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 = 1/33, to enable the hall elevator lock switch

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8.10 Elevator Commissioning Parameters

Before performing elevator commissioning, check whether the shaft is unobstructed and all related parameters are set correctly.

First run the elevator at inspection speed to the middle floor to ensure correct running direction. Run a single floor call, and then run multiple floor calls.

After the commissioning is completed, check whether the parameters in this section are set properly.

8.10.1 Car Call and Hall Call Test

Function Code	Parameter 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. They remain valid after the commissioning command is input, and become invalid until they are set to 0 or the system suffers power failure.

8.10.2 Random Running Test

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F7-03	Random running times	0–60000	0	-	☆
F7-08	Time interval of random running	0–1000	0	s	☆

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The NICE3000new 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.

8.10.3 Hall Call, Door Open, Overload, and Limit Enable

Function Code	Parameter Name	Setting Range	Default	Unit	Property
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 switch forbidden	0: No 1: Yes	0	-	☆

- F7-04 is used to forbid the hall calls.

  0: No (hall call allowed)

1: Yes (hall call forbidden)

- F7-05 is used to forbid door open.

  0: No (door open allowed)

  1: Yes (door open forbidden)

  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.

- F7-06 is used to set the overload function.

  0: Disabled (overload forbidden)

  1: Enabled (overload allowed)

  Note that overload is allowed (F7-06 = 1) only in the heavy-load test. Once the test is complete, forbid overload running immediately.

- F7-07 is used to forbid limit switches.

  0: No (Limit switch enabled)

  1: Yes (Limit switch disabled)

  The limit switch is disabled (F7-07 = 1) only in the test of the final limit switch. Use the function with caution.

8.11 Enhanced Function Parameters

8.11.1 Load Cell Auto-tuning

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F8-00	Load for load cell auto-tuning	0–100	0	%	★
F8-01	Pre-torque selection	0–2	0	-	★
F8-02	Pre-torque offset	0.0–100.0	50.0	%	★
F8-05	Current car load	0–1023	0	-	●
F8-06	Car no-load load	0–1023	0	-	★
F8-07	Car full-load load	0–1023	100	-	★

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.

- 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.

  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.

- F8-05 is readable and reflects the load condition in the car. The value is sampled by the NICE3000new by using a load cell to judge overload or full-load, or calculate the torque current for load cell pre-torque compensation.

- F8-06 and F8-07 respectively records the car no-load and full-load conditions in the car. They are AD sampling values.

8.11.2 Pre-torque Gain

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F8-03	Drive gain	0.00–2.00	0.60	-	★
F8-04	Brake gain	0.00–2.00	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 section 6.1.6.

8.11.3 Anti-nuisance Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F8-08	Anti-nuisance function	0, 1, 2, 4	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.

8.11.4 Hall Call Communication Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F8-14	HCB communication rate	Bit0: HCB communication baud rate Bit4: Energy saving of HCB communication	0	-	☆
F8-16	Start address of hall call auxiliary command	0–40	0	-	★
F8-17	Hall call address check	0–1	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 series products 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.

8.12 Time Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F9-00	Idle time before returning to base floor	0–240	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	Parameter Name	Setting Range	Default	Unit	Property
F9-01	Time for fan and lamp to be turned off	0–240	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	Parameter Name	Setting Range	Default	Unit	Property
F9-02	Motor running time limit	0–45	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	Parameter Name	Setting Range	Default	Unit	Property
F9-03	Clock: year	2000–2100	Current year	YYYY	☆
F9-04	Clock: month	1–12	Current month	MM	☆
F9-05	Clock: day	1–31	Current day	DD	☆
F9-06	Clock: hour	0–23	Current hour	HH	☆
F9-07	Clock: minute	0–59	Current minute	MM	☆

These parameters are used to set the current date and time of the system.

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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	Parameter Name	Setting Range	Default	Unit	Property
F9-09	Accumulative running time	0–65535	0	h	●
F9-11	High byte of running times	0–9999	0	-	●
F9-12	Low byte or running times	0–9999	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	Parameter Name	Setting Range	Default	Unit	Property
F9-13	Maintenance notification period	0–99	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.

8.13 Operation Panel Parameter Display

8.13.1 Parameter Display in Running/Stop State

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-01	Display in running state	1–65535	65535	-	☆

It is used to set the running parameters displayed on the operation panel when the elevator is in the running state.

FA-01 includes 16 binary bits, each defining a parameter. A total of 16 parameters can be can be displayed during running.

The 16 binary bits correspond to the running parameters listed in the following table.

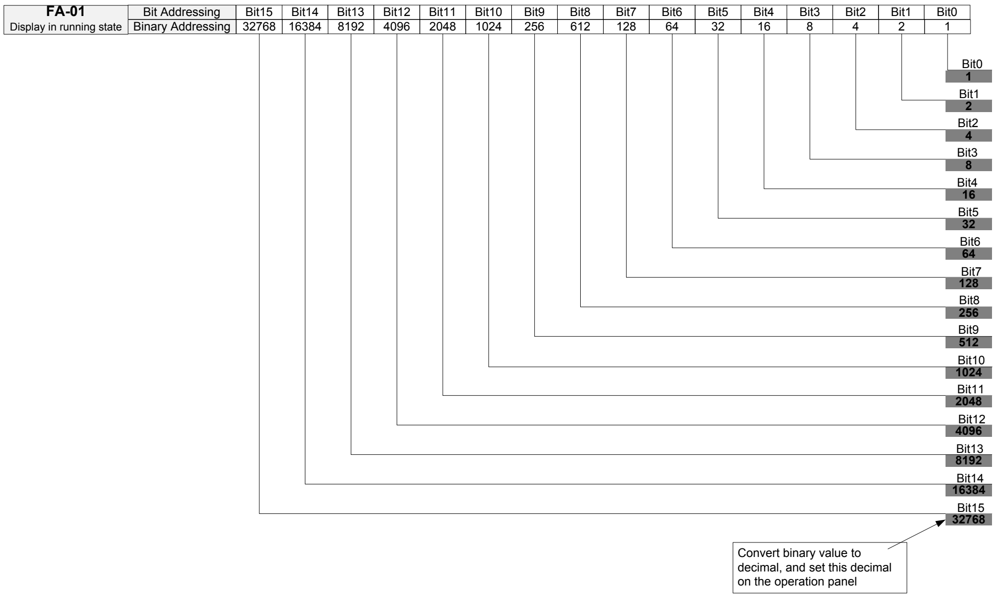
Bit	Parameter Name	Default	Bit	Parameter Name	Default
Bit0	Running speed	1	Bit8	Output terminal	1
Bit1	Set speed	1	Bit9	Current floor	1
Bit2	Bus voltage	1	Bit10	Current position	1
Bit3	Output voltage	1	Bit11	Car load	1
Bit4	Output current	1	Bit12	CTB input state	1
Bit5	Output frequency	1	Bit13	CTB output state	1
Bit6	Input terminal low bits	1	Bit14	System state	1
Bit7	Input terminal high bits	1	Bit15	Pre-toque current	1

The method of setting FA-01 is as follows:

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.

Convert the sum of binary values of all 16 bits to decimal, and then set the decimal on the operation panel.

Figure 8-13 Converting binary value of FA-01 to decimal



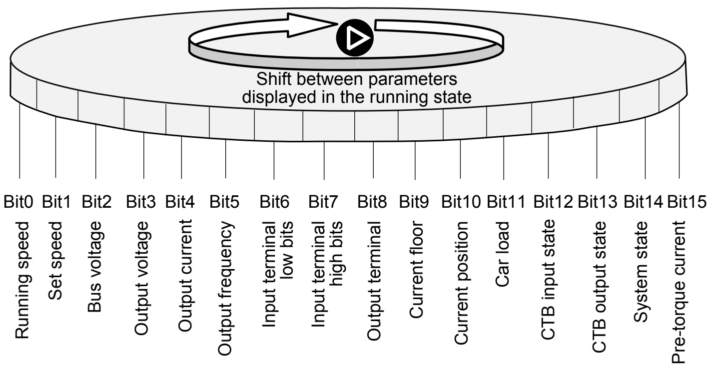
By default, all 16 parameters are displayed; therefore, the value set on the operation panel is:

1 + 2 + 4 + ...32768 = 65535

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 ▷ to view the parameter indicated by each bit circularly.

Figure 8-14 Shift between parameters displayed in the running state



Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-02	Display in stop state	1–65535	65535	-	☆

FA-01 includes 16 binary bits, each defining a parameters. 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.

Bit	Parameter Name	Default	Bit	Parameter Name	Default
Bit0	Set 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

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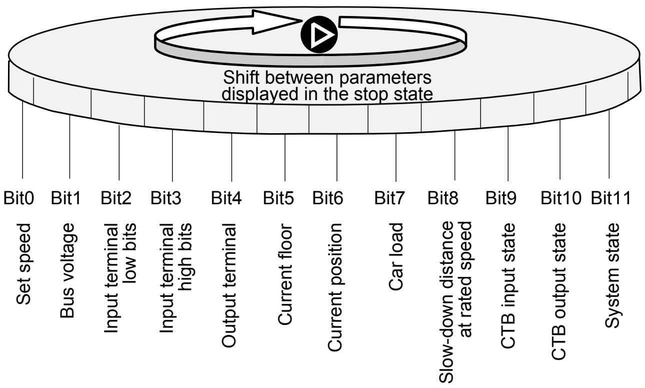
Bit	Parameter Name	Default	Bit	Parameter Name	Default
Bit4	Output terminal	1	Bit12	Reserved	0
Bit5	Current floor	1	Bit13	Reserved	0
Bit6	Current position	1	Bit14	Reserved	0
Bit7	Car load	1	Bit15	Reserved	0

The method of setting and viewing FA-02 is similar to that of FA-01.

Figure 8-15 Shift between parameters displayed in the stop state



The running and stop parameters of the NICE3000new system are the important references for engineers to perform commissioning on site. The parameters are described as follows:

1. Running speed: indicates the actual running speed of the elevator.

   Its maximum value is F0-03 (Maximum running speed), in unit of m/s.

2. Set speed: indicates the set speed of the NICE3000new system during elevator running. It is the running speed calculated by the system theoretically at which the elevator should run. Its unit is m/s.

3. Bus voltage: indicates the DC bus voltage of the NICE3000new system, in unit of m/s.

4. Output voltage: indicates the effective value of the equivalent voltage of the PWM wave output by the NICE3000new system, in unit of V.

5. Output current: indicates the effective value of the actual current when the NICE3000new system drives the motor to turn, in unit of A.

6. 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.

7. Input terminal low bits: indicate the signal states of input terminals by bit.

   A total of 16 bits are defined as below:

Bit	Meaning	Bit	Meaning
Bit0	Reserved	Bit8	Inspection signal
Bit1	Up leveling signal	Bit9	Inspection up signal
Bit2	Down leveling signal	Bit10	Inspection down signal
Bit3	Door zone signal	Bit11	Fire emergency signal
Bit4	Safety circuit feedback 1	Bit12	Up limit signal

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Bit	Meaning	Bit	Meaning
Bit5	Door lock circuit feedback 1	Bit13	Down limit signal
Bit6	RUN contactor feedback	Bit14	Overload signal
Bit7	Brake contactor feedback 1	Bit15	Full-load signal

After entering FA-01 or FA-02, you can press ▷ to view the parameter indicated by each bit circularly. If the bit in FA-01 or FA-02 indicating parameter "Input terminal low bits" is set to 1, the operation panel displays the value of this parameter in decimal.

Convert the decimal to binary, and you can know the setting of each bit in this parameter. If a bit is 1, the signal indicated by this bit is active; if this bit is 0, the indicated signal is inactive.

8. Input terminal high bits: indicates the signal states of input terminals by bit.

A total of 16 bits are defined as below:

Bit	Meaning	Bit	Meaning
Bit0	Up slow-down 1 signal	Bit8	Door machine 1 light curtain
Bit1	Down slow-down 1 signal	Bit9	Door machine 2 light curtain
Bit2	Up slow-down 2 signal	Bit10	Brake travel switch 2 input
Bit3	Down slow-down 2 signal	Bit11	Emergency evacuation signal
Bit4	Up slow-down 3 signal	Bit12	Elevator lock signal
Bit5	Down slow-down 3 signal	Bit13	Safety circuit 2 feedback
Bit6	Shorting door lock circuit contactor feedback	Bit14	Shorting PMSM stator contactor feedback
Bit7	Motor overheat signal	Bit15	Door lock circuit 2 feedback

The method of viewing this parameter is the same as that of parameter "Input terminal low bits".

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9. Output terminal: indicates the signal states of output terminals by bit.

A total of 16 bits are defined as below:

Bit	Meaning	Bit	Meaning
Bit0	Reserved	Bit8	Door 2 close
Bit1	RUN contactor control	Bit9	Contactors healthy
Bit2	Brake contactor control	Bit10	Fault state
Bit3	Shorting door lock circuit contactor output	Bit11	Running monitor
Bit4	Fire emergency floor arrival feedback	Bit12	Reserved
Bit5	Door 1 open	Bit13	Reserved
Bit6	Door 1 close	Bit14	Reserved
Bit7	Door 2 open	Bit15	Emergency buzzer control

The method of viewing this parameter is the same as that of parameter "Input terminal low bits".

10. Current floor: indicates the information of the physical floor where the elevator is located. It is the same as the value of F4-01.

11. Current position: indicates the absolute distance from the current elevator car to the leveling plate of the first floor, in unit of m.

12. Car load: indicates the percentage of the car load to the rated load judged by the NICE3000^{new} system based on data from the sensor, in unit of %.

13. CTB input state: indicates the CTB input states by bit.

A total of 16 bits are defined as below:

Bit	Meaning	Bit	Meaning
Bit0	Light curtain 1	Bit8	Door open button
Bit1	Light curtain 2	Bit9	Door close button
Bit2	Door open limit 1	Bit10	Door open delay button
Bit3	Door open limit 2	Bit11	Direct travel ride signal
Bit4	Door close limit 1	Bit12	Attendant signal
Bit5	Door close limit 2	Bit13	Direction change signal
Bit6	Full-load signal	Bit14	Independent running signal
Bit7	Overload signal	Bit15	Firefighter operation signal

The method of viewing this parameter is the same as that of parameter "Input terminal low bits".

14. CTB output state: indicates the CTB output states by bit.

A total of 16 bits are defined as below:

Bit	Meaning	Bit	Meaning
Bit0	Door open output 1	Bit8	Door open button display
Bit1	Door close output 1	Bit9	Door close button display
Bit2	Door lock signal	Bit10	Door open delay button display
Bit3	Door open output 2	Bit11	Non-door zone stop
Bit4	Door close output 2	Bit12	Reserved
Bit5	Door lock signal	Bit13	Buzzer output
Bit6	Up arrival gong signal	Bit14	Reserved
Bit7	Down arrival gong signal	Bit15	Energy saving signal

The method of viewing this parameter is the same as that of parameter "Input terminal low bits".

15. System state: indicates the system states by bit.

A total of 16 bits are defined as below:

Bit	Meaning	Bit	Meaning
Bit0	Light curtain state 1	Bit8	Car state: 1: Door open 2: Door open holding 3: Door close 4: Door close limit 5: Running
Bit1	Light curtain state 2	Bit9	
Bit2	Hall elevator lock (indicated on HCB)	Bit10	
Bit3	Hall fire emergency (indicated on HCB)	Bit11	

Bit	Meaning	Bit	Meaning
Bit4	Elevator state: 0: Inspection	Bit12	Full-load
Bit5	1: Shaft auto-tuning 3: Return to base floor at fire emergency	Bit13	Overload
Bit6	4: Firefighter operation 6: Attendant operation	Bit14	Reserved
Bit7	7: Automatic (normal)	Bit15	Reserved

The method of viewing this parameter is the same as that of parameter "Input terminal low bits".

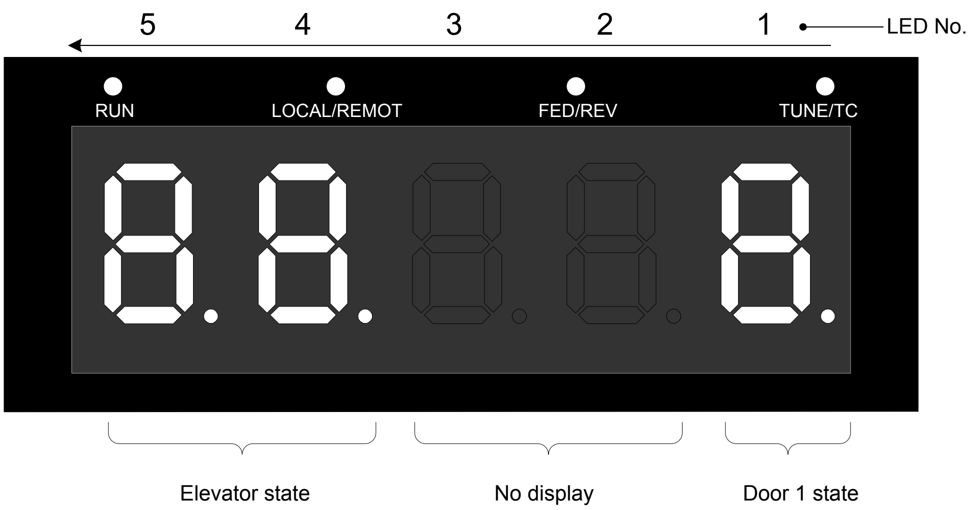
16. Pre-torque current: indicates the percentage of the pre-torque current compensated by the NICE3000new system at startup to the rated current, in unit of %.

8.13.2 Elevator and Door State Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-12	Logic information	0–65535	0	-	●

It displays the elevator and door state.

Figure 8-16 Elevator and door state display

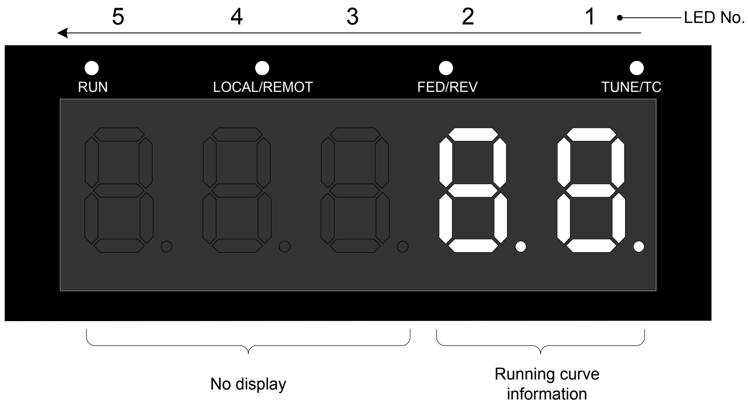


1		2	3	4		5	
Door 1 State		No Display		Elevator State			
0	Waiting state			00	Inspection state	08	Elevator lock
1	Door open state			01	Shaft auto-tuning	09	Idle elevator parking
2	Door open limit			02	Micro-leveling	10	Re-leveling at inspection speed
3	Door close state	-		03	Returning to base floor at fire emergency	11	Emergency evacuation operation
4	Door close limit			04	Firefighter operation	12	Motor auto-tuning
-	-			05	Fault state	13	Keypad control
-	-			06	Attendant operation	14	Base floor check
-	-			07	Automatic running	15	VIP state

8.13.3 System Running Curve Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-13	Curve information	0–65535	0	-	●

It displays the system running curve information



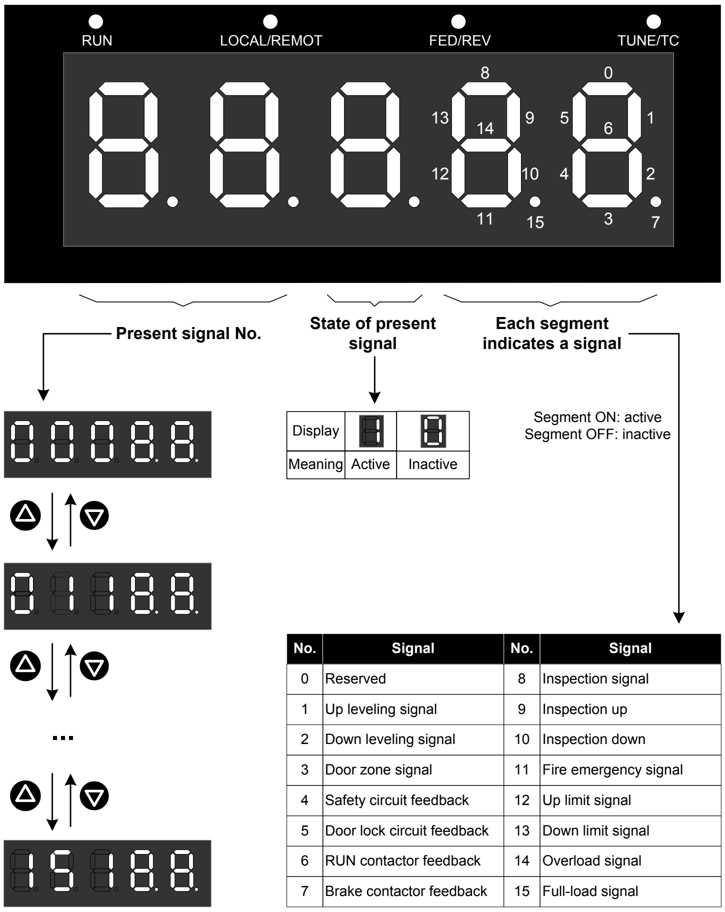
1		2		3	4	5
Curve Information				No Display		
00	Standby state	09	Deceleration start segment			
01	Zero-speed start segment	10	Linear deceleration segment			
02	Zero-speed holding segment	11	Deceleration end segment			
03	Reserved	12	Zero speed at stop			
04	Startup speed stage	13	Current stop stage	-		
05	Acceleration start segment	14	Reserved			
06	Linear acceleration segment	15	Stop data processing			
07	Acceleration end segment	16-20	Auto-tuning stage			
08	Stable-speed running segment	21	Emergency operation			

8.13.5 MCB Input/Output State Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-26	Input state 1	0–65535	0	-	●
FA-27	Input state 2	0–65535	0	-	●
FA-28	Input state 3	0–65535	0	-	●
FA-30	Input state 5	0–65535	0	-	●
FA-31	Output state 1	0–65535	0	-	●
FA-32	Output state 2	0–65535	0	-	●

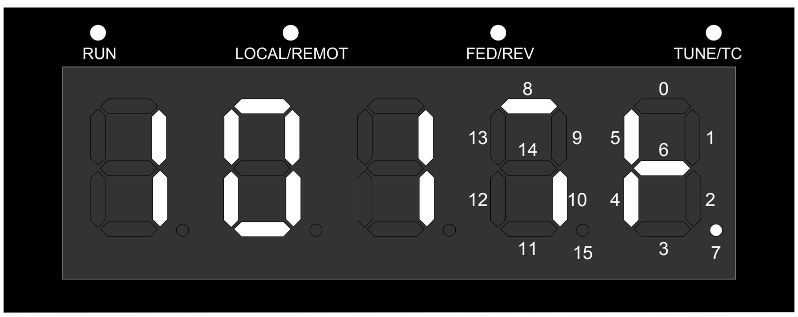
These parameters display the system input and output states.

Figure 8-17 FA-26 Input state



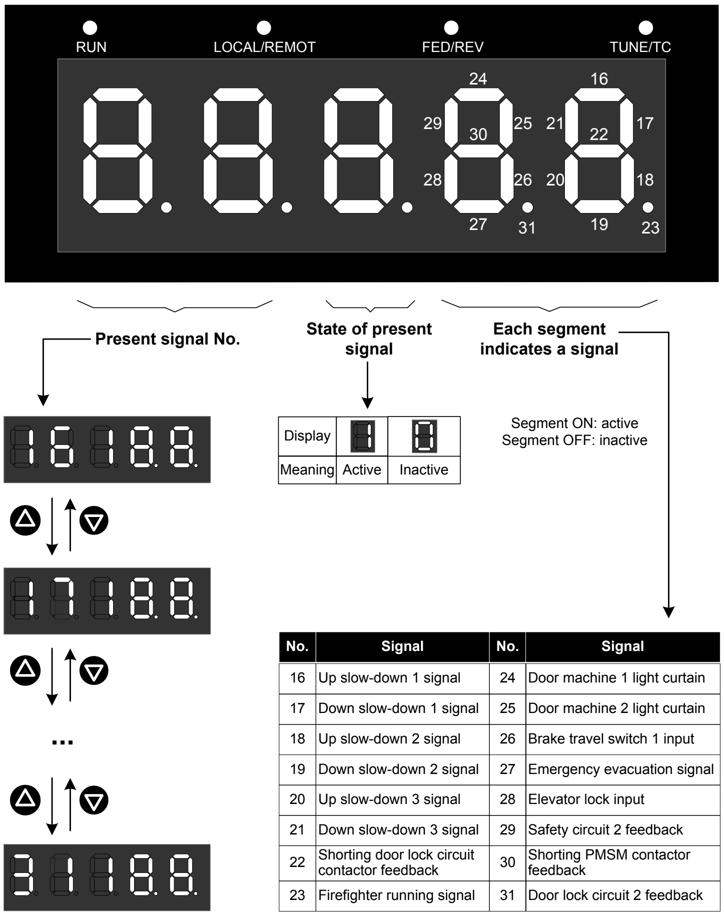
No.	Signal	No.	Signal
0	Reserved	8	Inspection signal
1	Up leveling signal	9	Inspection up
2	Down leveling signal	10	Inspection down
3	Door zone signal	11	Fire emergency signal
4	Safety circuit feedback	12	Up limit signal
5	Door lock circuit feedback	13	Down limit signal
6	RUN contactor feedback	14	Overload signal
7	Brake contactor feedback	15	Full-load signal

Figure 8-18 Example display of FA-26



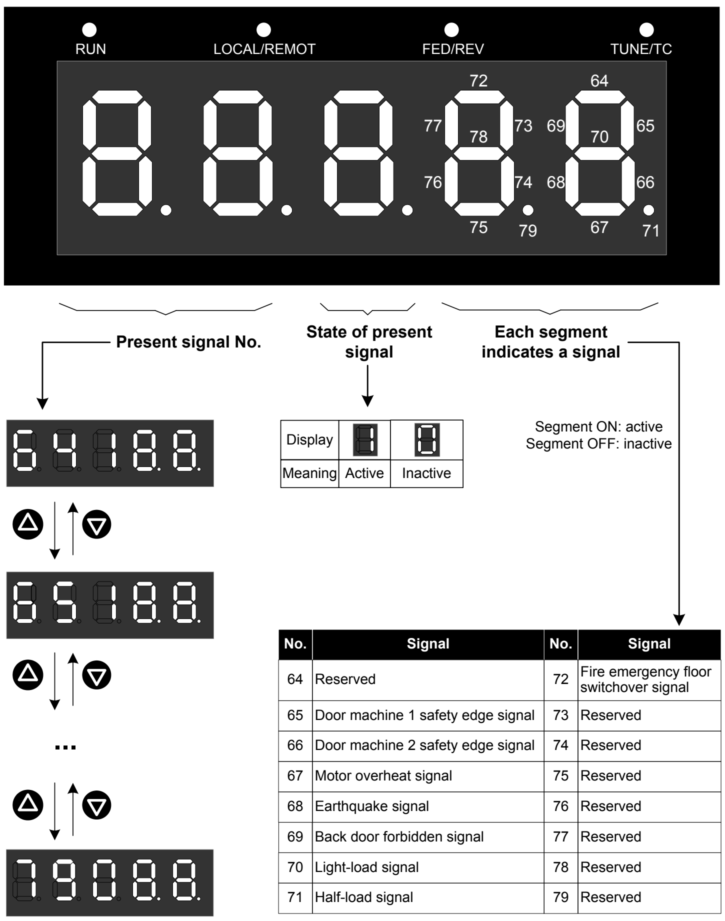
According to the preceding figure, the currently viewed signal 10 (Inspection down) is 1 (Active); besides signal 10, signals 4 (Safety circuit feedback), 5 (Door lock circuit feedback), 6 (RUN contactor feedback), 7 (Brake contactor feedback), and 8 (Inspection signal) are active.

Figure 8-19 FA-27 Input state 2



No.	Signal	No.	Signal
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 input
19	Down slow-down 2 signal	27	Emergency evacuation signal
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 contactor feedback
23	Firefighter running signal	31	Door lock circuit 2 feedback

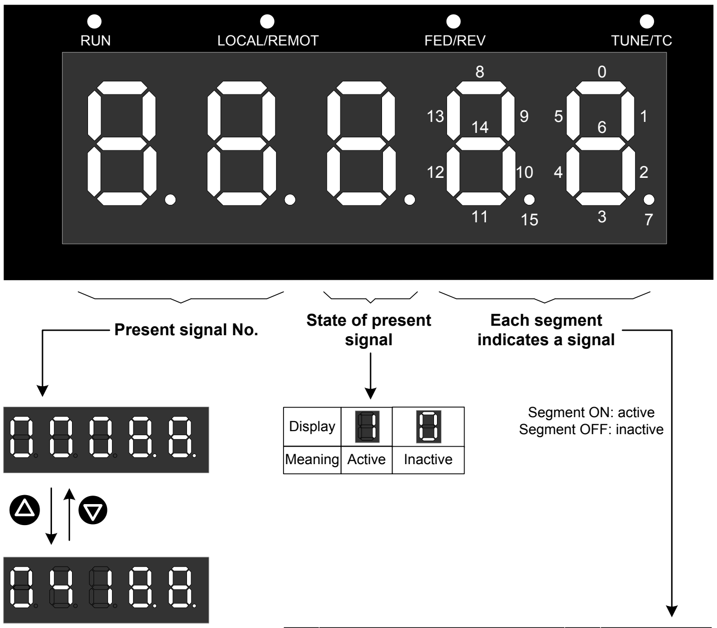
Figure 8-20 FA-28 Input state 3



No.	Signal	No.	Signal
64	Reserved	72	Fire emergency floor switchover signal
65	Door machine 1 safety edge signal	73	Reserved
66	Door machine 2 safety edge signal	74	Reserved
67	Motor overheat signal	75	Reserved
68	Earthquake signal	76	Reserved
69	Back door forbidden signal	77	Reserved
70	Light-load signal	78	Reserved
71	Half-load signal	79	Reserved

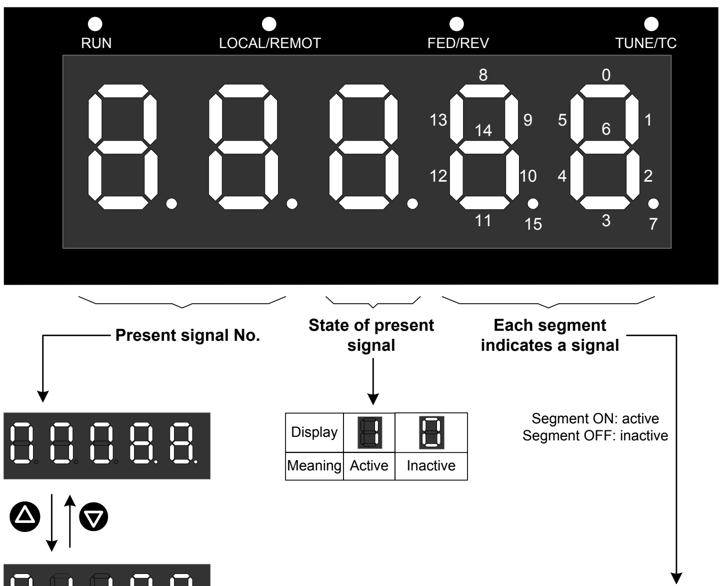
8

Figure 8-21 FA-30 Input state 5



No.	Signal	No.	Signal
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 signal	13	Reserved
6	Reserved	14	Reserved
7	Reserved	15	Reserved

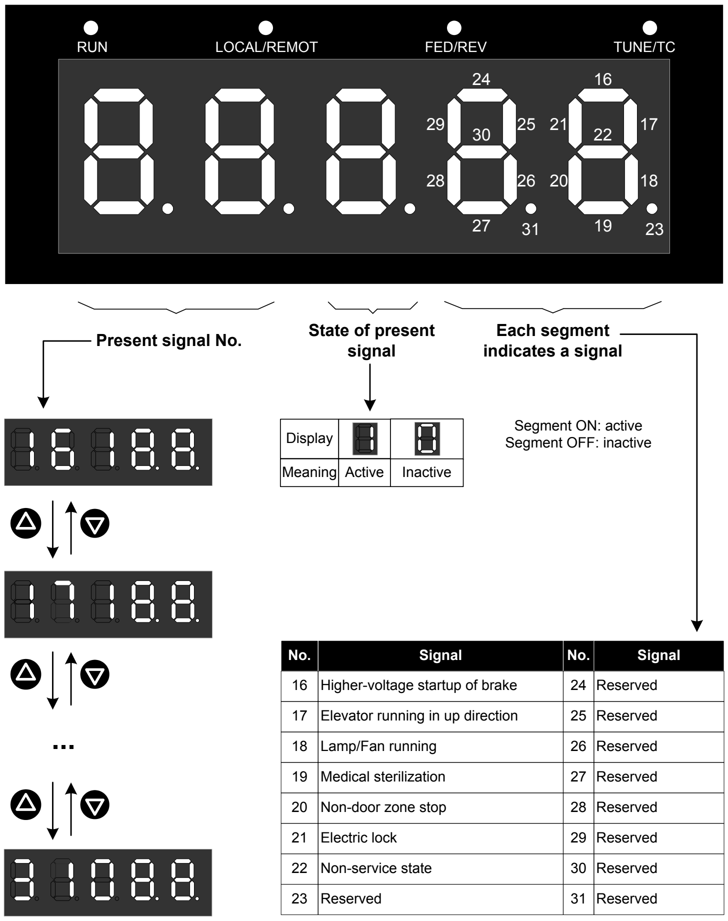
Figure 8-22 FA-31 Output state 1



No.	Signal	No.	Signal
0	Reserved	8	Door 2 close
1	RUN contactor control	9	Brake and RUN contactors healthy
2	Brake contactor control	10	Fault state above level 3
3	Shorting door lock circuit contactor control	11	Running monitor
4	Fire emergency floor arrival feedback	12	Shorting PMSM stator contactor
5	Door 1 open	13	Emergency evacuation automatic switchover
6	Door 1 close	14	System healthy
7	Door 2 open	15	Emergency buzzer control

8

Figure 8-23 FA-32 Output state 2



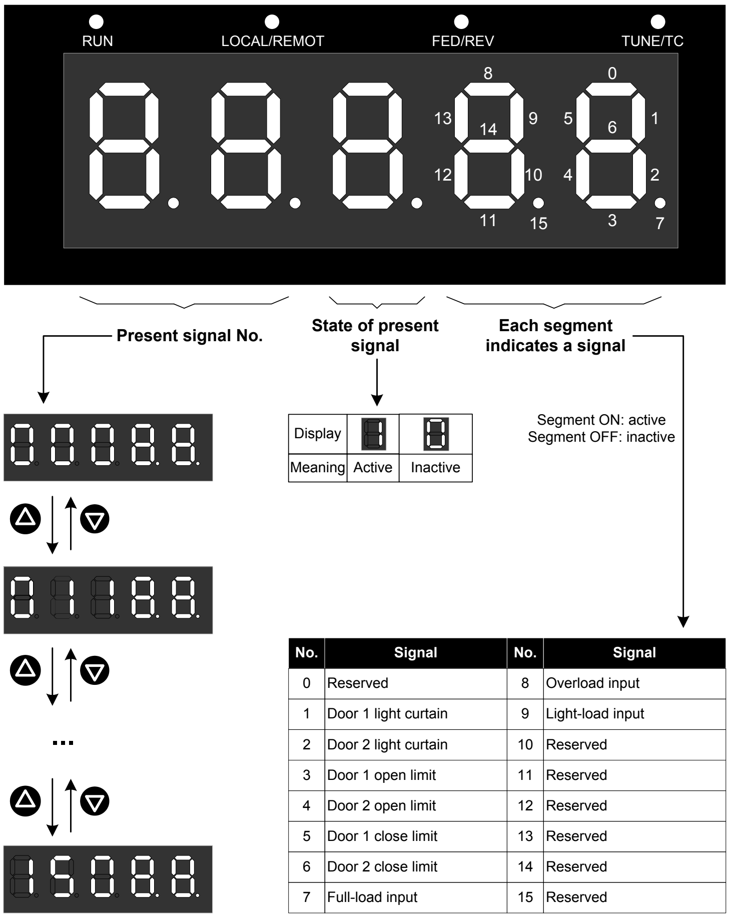
No.	Signal	No.	Signal
16	Higher-voltage startup of brake	24	Reserved
17	Elevator running in up direction	25	Reserved
18	Lamp/Fan running	26	Reserved
19	Medical sterilization	27	Reserved
20	Non-door zone stop	28	Reserved
21	Electric lock	29	Reserved
22	Non-service state	30	Reserved
23	Reserved	31	Reserved

8.13.6 Car Input/Output State Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-33	Car input state	0–65535	0	-	●
FA-34	Car output state	0–65535	0	-	●

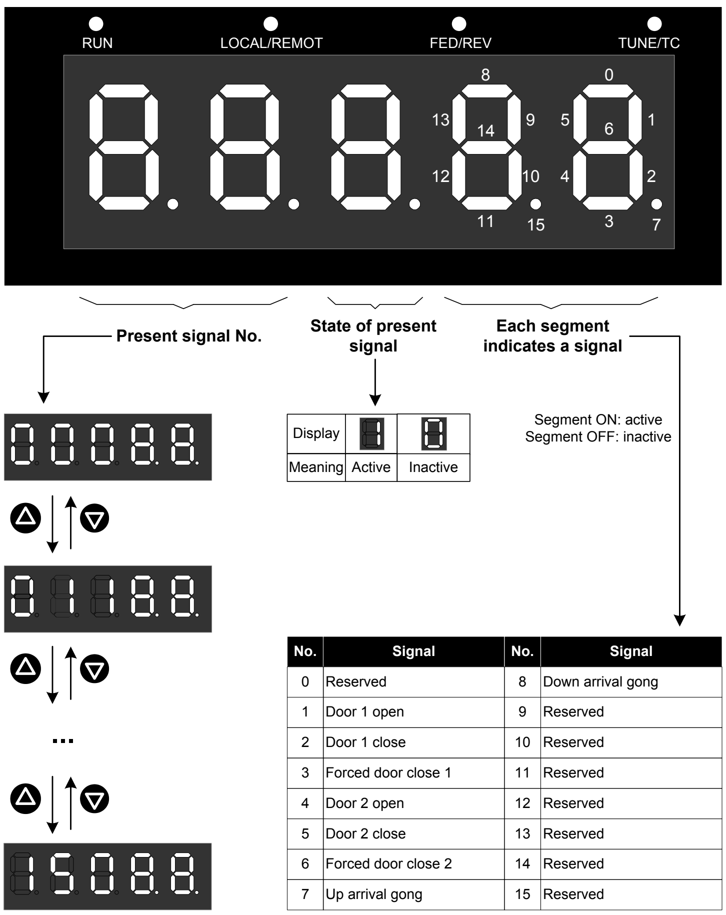
They are used to display the car input and output states.

Figure 8-24 FA-33 Car input state



No.	Signal	No.	Signal
0	Reserved	8	Overload input
1	Door 1 light curtain	9	Light-load input
2	Door 2 light curtain	10	Reserved
3	Door 1 open limit	11	Reserved
4	Door 2 open limit	12	Reserved
5	Door 1 close limit	13	Reserved
6	Door 2 close limit	14	Reserved
7	Full-load input	15	Reserved

Figure 8-25 FA-34 Car output state



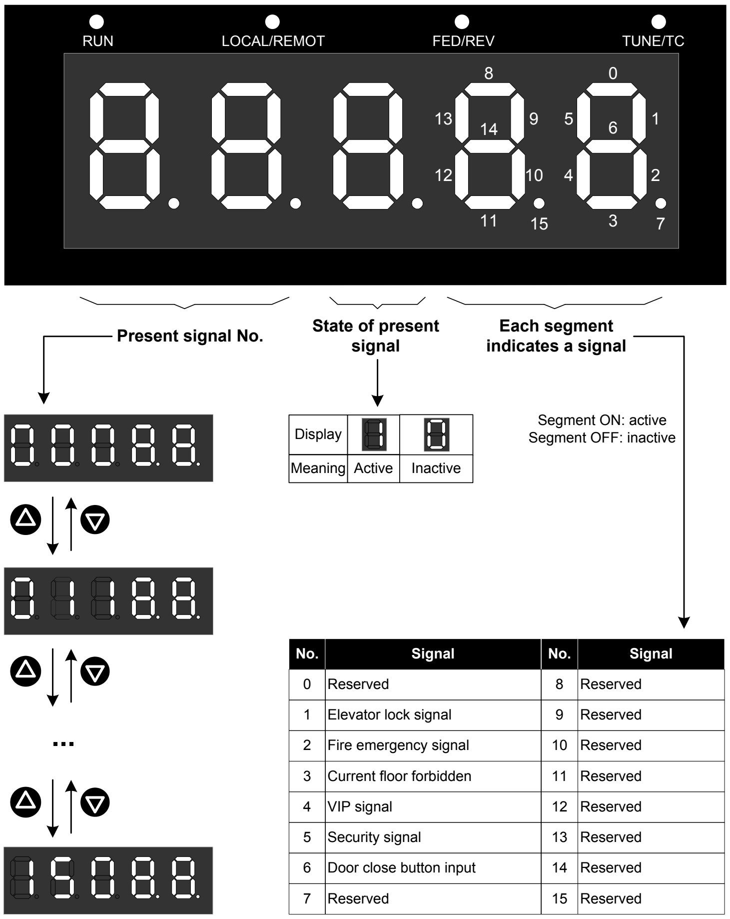
No.	Signal	No.	Signal
0	Reserved	8	Down arrival gong
1	Door 1 open	9	Reserved
2	Door 1 close	10	Reserved
3	Forced door close 1	11	Reserved
4	Door 2 open	12	Reserved
5	Door 2 close	13	Reserved
6	Forced door close 2	14	Reserved
7	Up arrival gong	15	Reserved

8.13.7 Hall State and System State Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-35	Hall sate	0–65535	0	-	●
FA-36	System state 1	0–65535	0	-	●
FA-37	System state 2	0–65535	0	-	●

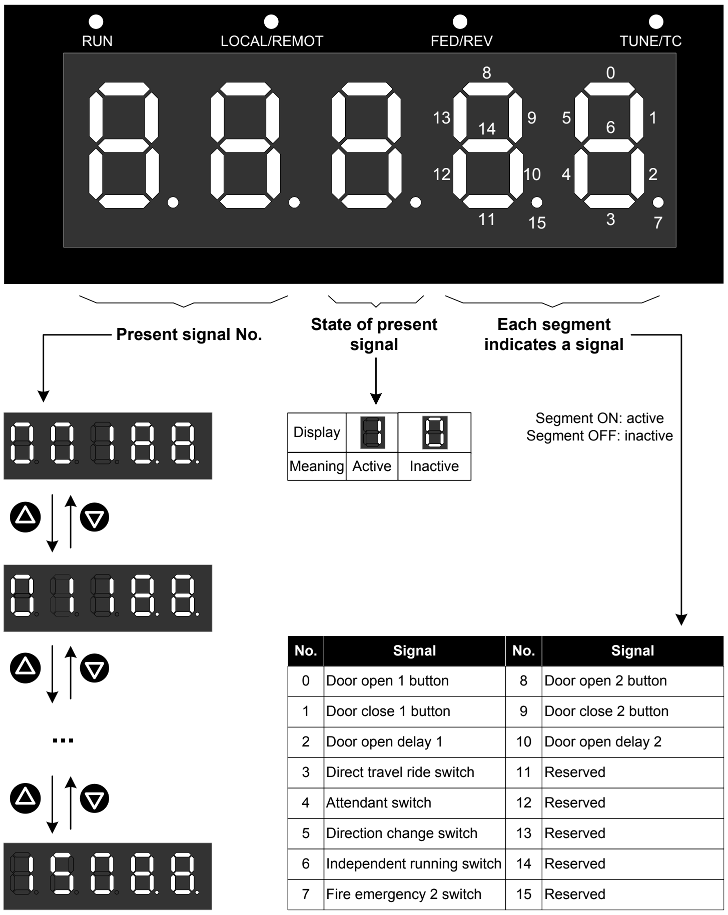
They are used to display the car input and output states.

Figure 8-26 FA-35 Hall state



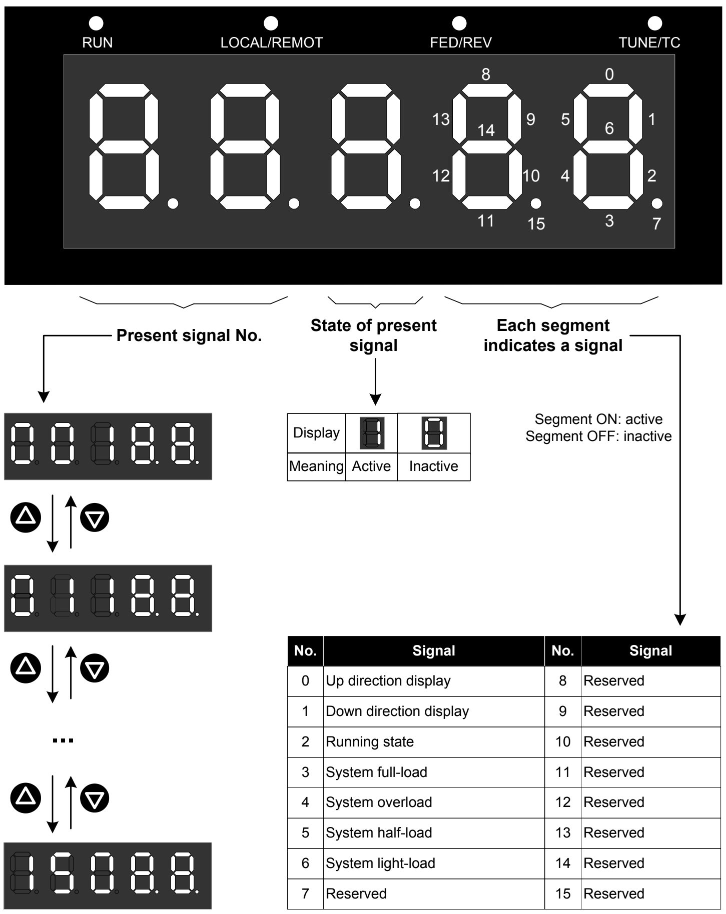
No.	Signal	No.	Signal
0	Reserved	8	Reserved
1	Elevator lock signal	9	Reserved
2	Fire emergency signal	10	Reserved
3	Current floor forbidden	11	Reserved
4	VIP signal	12	Reserved
5	Security signal	13	Reserved
6	Door close button input	14	Reserved
7	Reserved	15	Reserved

Figure 8-27 FA-36 System state 1



No.	Signal	No.	Signal
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 running switch	14	Reserved
7	Fire emergency 2 switch	15	Reserved

Figure 8-28 FA-37 System state 2



No.	Signal	No.	Signal
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

8

8.13.8 Software Version View

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-05	MCB board software	0–65535	0	-	●
FA-06	Drive board software	0–65535	0	-	●
Fb-01	CTB software	00–999	0	-	●

FA-05 displays the software versions.

For example, if the MCB version is 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.

FA-06 and FB-01 respectively displays the versions of the drive board and CTB.

8.13.9 Other Parameter Display

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-03	Current encoder angle	0.0–359.9	0.0	Degree (°)	●
FA-07	Heatsink temperature	0–100	0	°C	●
FA-11	Pre-torque current	0.0–200.0	0	%	●
FA-14	Set speed	0.000–4.000	0	m/s	●
FA-15	Feedback speed	0.000–4.000	0	m/s	●
FA-16	Bus voltage	0–999.9	0	V	●
FA-17	Present position	0.00–300.0	0	m	●
FA-18	Output current	0.0–999.9	0	A	●
FA-19	Output frequency	0.00–99.99	0	Hz	●
FA-20	Torque current	0.0–999.9	0	A	●
FA-21	Output voltage	0–999.9	0	V	●
FA-22	Output torque	0–100	0	%	●
FA-23	Output power	0.00–99.99	0	kW	●

FA-03 displays the real-time encoder angle. This parameter cannot be modified.

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.

FA-11 displays the percentage of pre-torque current to the rated current (positive/negative display, indicating driving or braking).

FA-14 to FA-23 display the current performance state of the system (the output torque and output power supports positive/negative display).

8.13.10 Keypad Display Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FA-00	Keypad display selection	0–3	3	-	☆

The NICE3000new system has three buttons and three 7-segment LEDs on the MCB. You can change the display content through the setting of this parameter.

- 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

8.14 Door Function Parameters

8.14.1 Door Machine and Opposite Door Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-00	Number of door machine(s)	1–2	1	-	★
FC-04	Opposite door control selection	0–3	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

For details on the use of the opposite door, see section 6.2.4.

8.14.2 Door Open/Close Time and Arrive Gong Delay

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-06	Door open protection time	5–99	10	s	☆
Fb-07	Arrival gong output delay	0–1000	0	ms	☆
Fb-08	Door close protection time	5–99	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

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times reach the value set in Fb-09, the system reports fault Err48.

- 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 Err49.

8.14.3 Door Re-open Times and Door State at Standby

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-09	Door open/close protection times	0–20	0	-	☆
Fb-10	Door state of standby elevator	0–2	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 standby 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

8.14.4 Door Open Holding Time

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-11	Door open holding time for hall call	1–1000	5	s	☆
Fb-12	Door open holding time for car call	1–1000	3	s	☆
Fb-13	Door open holding time at base floor	1–1000	10	s	☆
Fb-14	Door open holding time at such signal input	10–1000	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.

8.14.5 Special Door Open, Manual Holding, and Forced Door Close Time

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fb-15	Special door open holding time	10–1000	30	s	☆
Fb-16	Manual door open holding time	1–60	5	s	☆
Fb-17	Holding time for forced door close	5–180	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.

8.15 Protection Function Parameters

8.15.1 Motor Overload Protection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-01	Program control 2 for protection function	Bit0: Overload protection	1	-	★
FC-02	Overload protection coefficient	0.50–10.00	1.00	-	★
FC-03	Overload pre-warning coefficient	50–100	80	%	★

FC-01 Bit0 = 0: overload protection disabled; BIT0 = 1: overload protection enabled

For details on the description and setting method of FC-01, see section 8.21.1.

After detecting that the output current exceeds (FC-02 x Rated motor current) and the duration lasts the time specified in the inverse time lag curve, the controller outputs fault Err11 indicating motor overload.

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.

8.15.2 Controller Protection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-00	Program control for protection function	Bit0: Short circuit to ground detection at power-on	0	-	★
FC-01	Program control 2 for protection function	Bit0: Canceling protection at output phase loss, Canceling protection at input phase loss	0	-	★

1. Short circuit to ground detection at power-on

   - FC-00 Bit0 = 1: The controller detects the short circuit to ground fault at power-on. If detecting the fault, the controller blocks the output immediately and reports the fault.

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- FC-00 Bit0 = 0: The controller does not detect the short circuit to ground fault at power-on.

2. Protection at output phase loss
   - FC-01 Bit1 = 1: Protection at output phase loss is cancelled.
   - FC-01Bit1 = 0: The controller detects and reports the output phase loss fault.

3. Protection at input phase loss
   - FC-01 Bit14 = 1: Protection at input phase loss is cancelled.
   - FC-01 Bit14 = 0: The controller detects and reports the input phase loss fault.

8.16 Fault Information View

8.16.1 Designated Fault Information

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-06	Designated fault	0–99	0	-	☆
FC-07	Designated fault code	0–9999	0	-	●
FC-08	Designated fault subcode	0–65535	0	-	●
FC-09	Designated fault month and day	0–1231	0	MM.DD	●
FC-10	Designated fault hour and minute	0–23.59	0	HH.MM	●
FC-11	Logic information of designated fault	0–65535	0	-	●
FC-12	Curve information of designated fault	0–65535	0	-	●
FC-13	Set speed upon designated fault	0.000–4.000	0	m/s	●
FC-14	Feedback speed upon designated fault	0.000–4.000	0	m/s	●
FC-15	Bus voltage upon designated fault	0.0–999.9	0	V	●
FC-16	Current position upon designated fault	0.0–300.0	0	m	●
FC-17	Output current upon designated fault	0.0–999.9	0	A	●
FC-18	Output frequency upon designated fault	0.00–99.99	0	Hz	●
FC-19	Torque current upon designated fault	0.0–999.9	0	A	●

These parameters are used to monitor the designated fault code. The information about the designated fault code is saved in parameters of FC-07 to FC-19, and will not be overwritten.

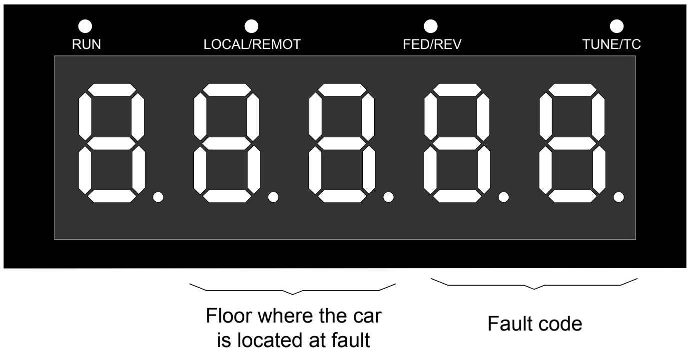
8.16.2 Last 10 Fault Information

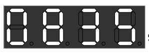
Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-20	1st fault code	0–9999	0	-	●
FC-21	1st fault subcode	0–65535	0	-	●
FC-22	1st fault month and day	0–1231	0	MM.DD	●
FC-23	1st fault hour and minute	0–23.59	0	HH.MM	●
FC-24	2nd fault code	0–9999	0	-	●
FC-25	2nd fault subcode	0–65535	0	-	●

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-26	2nd fault month and day	0–1231	0	MM.DD	●
FC-27	2nd fault hour and minute	0–23.59	0	HH.MM	●
		…			
FC-56	10th fault code	0–9999	0	-	●
FC-57	10th fault subcode	0–65535	0	-	●
FC-58	10th fault month and day	0–1231	0	MM.DD	●
FC-59	10th fault hour and minute	0–23.59	0	HH.MM	●

These parameters record the latest 10 faults of the elevator.

Figure 8-29 Fault code display



For example, if FC-20 is displayed as , indicating that the 1st fault code is Err35 and the car is near floor 8 when this fault occurs.

The fault subcode is used to locate the causes of the fault. The specific fault time is recorded in month, day, hour and minute.

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8.16.3 Latest 10 Fault Information

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-60	Latest fault code	0–9999	0	-	●
FC-61	Latest fault subcode	0–65535	0	-	●
FC-62	Latest fault month and day	0–1231	0	MM.DD	●
FC-63	Latest fault hour and minute	0–23.59	0	HH.MM	●
FC-64	Logic information of latest fault	0–65535	0	-	●
FC-65	Curve information of latest fault	0–65535	0	-	●
FC-66	Set speed upon latest fault	0.000–4.000	0	m/s	●
FC-67	Feedback speed upon latest fault	0.000–4.000	0	m/s	●
FC-68	Bus voltage upon latest fault	0.0–999.9	0	V	●
FC-69	Current position upon latest fault	0.0–300.0	0	m	●
FC-70	Output current upon latest fault	0–999.9	0	A	●
FC-71	Output frequency upon latest fault	0.00–99.99	0	Hz	●
FC-72	Torque current upon latest fault	0.0–999.9	0	A	●

8.17 Communication Parameters and HCB/HCB-B Terminal Function Selection

8.17.1 Communication Parameters

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fd-00	Baud rate	0: 9600 1: 38400	0	bps	★
Fd-02	Local address	0–127 0: Broadcast address	1	-	★
Fd-03	Communication response delay	0–20	10	ms	★
Fd-04	Communication timeout	0.0–60.0 0: Invalid	0.0	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.

8.17.2 HCB Terminal Function Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fd-07	HCB:JP1 input	0: Reserved 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	-	★

These parameters are used to set the functions of pins 2 and 3 of JP1 and JP2 on the HCB.

The setting is effective to the HCBs at all floors.

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Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fd-09	HCB:JP1 output	0: Invalid 1: Up arrival indicator 2: Down arrival indicator 3: Fault output	1	-	★
Fd-10	HCB:JP2 output	4: Non-door zone stop output 5: Non-service state output 6: Door close button indicator output	2	-	★

These parameters are used to set the functions of pins 1 and 4 of JP1 and JP2 on the HCB.

The setting is effective to the HCBs for all floors.

8.17.3 HCB-B Terminal Function Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fd-11	HCB-B:JP1 input	0: Reserved NO/NC input: 1/33: Light-load signal 2/34: Half-load signal 3/35: Door 2 selection 4/36: Door 2 restricted (back door forbidden) 5/37: Door 1 safety edge 6/38: Door 2 safety edge 7/39: Single/Double door selection	0	-	★
Fd-12	HCB-B:JP2 input		0	-	★
Fd-13	HCB-B:JP3 input		0	-	★
Fd-14	HCB-B:JP4 input		0	-	★
Fd-15	HCB-B:JP5 input		0	-	★
Fd-16	HCB-B:JP6 input		0	-	★

These parameters are used to set the functions of pins 2 and 3 of JP1 to JP6 on the HCB-B no-display parallel-serial conversion board.

The setting is effective to all HCB-Bs connected to the system.

Function Code	Parameter Name	Setting Range	Default	Unit	Property
Fd-17	HCB-B:A1 output	0: Reserved 1: Fault output 2: Non-door zone stop output 3: Non-service state output 4: Fire emergency output 5: Power failure emergency output 6: Door lock valid 7: Night output signal	0	-	★
Fd-18	HCB-B:A2 output		0	-	★
Fd-19	HCB-B:B1 output		0	-	★
Fd-20	HCB-B:B2 output		0	-	★
Fd-21	HCB-B:C1 output		0	-	★
Fd-22	HCB-B:C2 output		0	-	★
Fd-23	HCB-B:C3 output		0	-	★
Fd-24	HCB-B:C4 output		0	-	★
Fd-25	HCB-B:C5 output		0	-	★
Fd-26	HCB-B:C6 output		0	-	★

These parameters are used to set the functions of four relay outputs and six open-collector outputs on the HCB-B no-display parallel-serial conversion board.

The setting is effective to all HCB-Bs connected to the system.

8.18 Elevator Function Parameters

8.18.1 Floor Display Setting

Function Code	Parameter 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.

8.18.2 Floor Special Display Setting

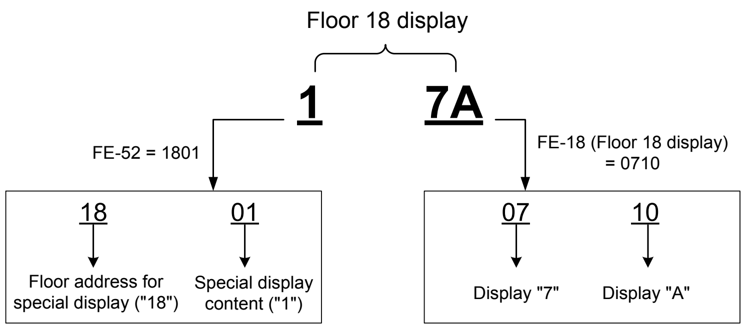
Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-52	Highest digit selection 1		0	-	☆
FE-53	Highest digit selection 2		0	-	☆
FE-54	Highest digit selection 3	0–4099	0	-	☆
FE-55	Highest digit selection 4		0	-	☆
FE-56	Highest digit selection 5		0	-	☆

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-52 to 1801 (displaying "1").

Figure 8-30 Setting floor 18 display to "17A"



Step 2: Set F8-14 Bit0 to 1.

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Step 3: Power off the system and power it on again.

8.19 Leveling Adjustment

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F4-00	Leveling adjustment	0–60	30	mm	★
Fr-00	Leveling adjustment function	0: Disabled 1: Enabled	0	-	★
Fr-01	Leveling adjustment record 1		30030	mm	★
Fr-02	Leveling adjustment record 2	00000–60060	30030	mm	★
…			…		
Fr-20	Leveling adjustment record 20		30030	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.

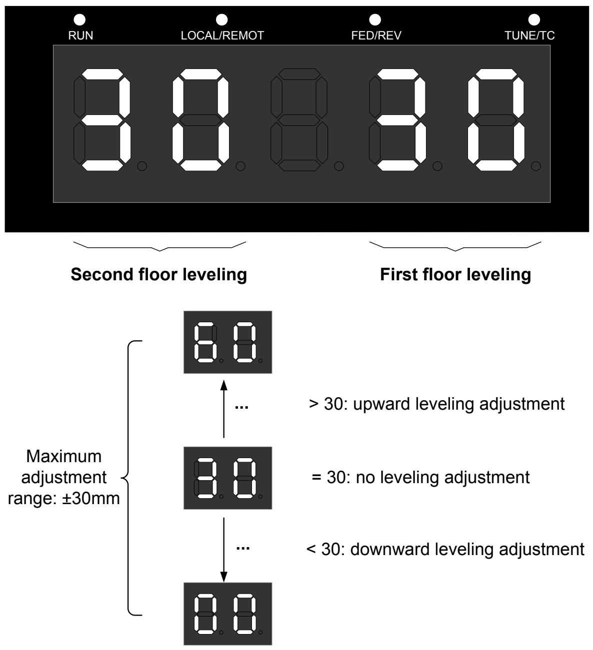
This parameter takes effect to leveling of all floors. Therefore, if leveling at a single floor is inaccurate, adjust the position of the leveling plate.

The NICE3000new has the advanced distance control algorithm and adopts many methods to ensure reliability of direct travel ride. Generally you need not modify this parameter.

- Fr-01 to Fr-20 record the leveling adjustment values. Each parameter records the adjustment information of two floors, and therefore, the adjustment information of 40 floors can be recorded totally.

  The method of viewing the record is shown in the following figure.

Figure 8-31 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 leveling adjustment method is as follows:

1. Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
2. Set Fr-00 to 1 to enable the car leveling adjustment function. Then, the elevator shields hall calls, automatically runs to the top floor, and keeps the door open after arrival. If the elevator is at the top floor, it directly keeps the door open.
3. Go into the car, press the top floor button on the CCB once, and the leveling position is changed 1 mm upward; press the bottom floor button on the CCB once, and the leveling position is changed 1 mm downward. The value is displayed on the car display board.
4. Positive value: up arrow + value, negative value: down arrow + value, adjustment range: ±30 mm
5. After completing adjustment for the present floor, press the top floor button and bottom floor button at the same time to save the adjustment result. The car display restores to the normal state. If the

leveling position of the present floor need not be adjusted, press the top floor button and bottom floor button at the same time to exit the leveling adjustment state. Then, car calls can be registered.

6. Press the door close button, and press the button for the next floor. The elevator runs to the next floor and keeps the door open after arrival. Then, you can perform leveling adjustment.
7. After completing adjustment for all floors, set Fr-00 to 0 to disable the leveling adjustment function. Otherwise, the elevator cannot be used.

8.20 User-related Parameters

8.20.1 User Password, Setting Restoration and Check

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FP-00	User password	0–65535	0	-	☆
FP-01	Parameter update	0: No operation 1: Restore default setting (except group F1) 2: Clear fault records	0	-	★
FP-02	User-defined parameter display	0: Invalid 1: Valid	0	-	★

- FP-00 is used to set the user password.

  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 our technical support to replace the control board.

- If you set FP-01 to 1 (Restore default settings), all parameters except group F1 are restored to the default settings. Be cautions with this setting.

- FP-02 is used to set whether to display the parameters that are modified.

  When it is set to 1, the parameters that are different from the default setting are displayed.

8.20.2 Contract No. Check

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FP-05	Contract No. 2	0–65535	0	-	☆
FP-06	Contract No. 1	0–65535	5555	-	★

These two parameters are used for the HCB or door machine software requiring contract No. check. If the contract No. check fails, the system cannot work properly.

You need not change these parameters generally.

8.21 Program Control and Function Set in Bit

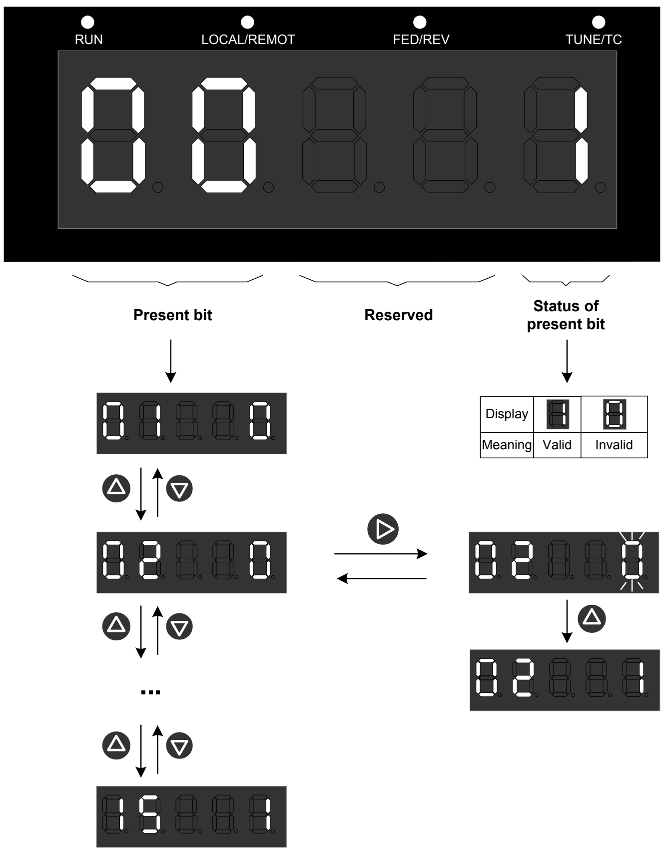
8.21.1 How to View and Set Function Code in Bit

Certain function codes are viewed and modified in bit. The following part takes Fx-xx (containing 16 bits, each defining a function) as an example to describe how to view and modify such function codes.

The methods of viewing Fx-xx are as follows:

- Method 1 (viewing decimal value): After you enter Fx-xx, the operation panel displays a decimal number, corresponding to the sum of all the valid binary values. The decimal number can be viewed only and cannot be changed.
- Method 2 (viewing value of each bit): On the decimal number display interface, press or , and the operation panel displays the value of each bit cyclically.

Figure 8-32 Viewing Fx-xx in bit



The preceding figure shows that Bit0 is valid, that is, the function defined by Bit0 is enabled.

The method of setting Fx-xx is as follows:

You can set a total of 16 bits (Bit0 to Bit15). Press or on the operation panel to view the bits cyclically, and press to set the status of the present bit.

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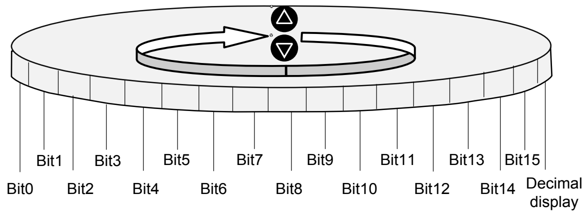
Figure 8-33 Viewing bits cyclically



8.21.2 Function Codes in Bit

The function codes that can be viewed and set in bit are listed in the following table.

Function Code	Description
F5-25	See the description in section 8.6.5.
F5-33	See the following part.
F6-09	
F6-11	
F6-40	
F6-41	
F6-42	
F6-43	See the description in section 8.8.6.
F6-44	See the description in section 8.9.1.
F6-45	See the description in section 8.8.7.
FC-00	See the following part.
FC-01	
FE-32	
FE-33	

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◆ F5-33 Terminal Program Control

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F5-33	Terminal program control	0–65535	0	-	★

F5-33 is used to select the elevator functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F5-33 are described in the following table.

Bit	Function	Description	Default
Bit3	Elevator fire emergency requirement for Hong Kong	If it is enabled, the fire emergency functions in F6-44 applied 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

Bit	Function	Description	Default
Bit7	Fault code not displayed on the keypad	The keypad does not blink to display the fault code.	0
Bit8	Door open command cancelled 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

◆ F6-09 Elevator Program Control

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-09	Elevator program control	0–65535	0	-	★

F6-09 is used to select the elevator functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-09 are described in the following table.

Bit	Function	Description	Default
Bit0	Dispersed waiting	In single elevator or parallel/group mode, if this function is enabled, an idle elevator will not return to the base floor. In group mode, this function is used together with the group control board to implement dispersed waiting.	0
Bit3	Parallel/Group control implemented at CAN2	This function is enabled when the parallel/group mode is implemented at CAN2 on the MCB.	0
Bit4	Group control in compatibility with NICE3000	This function is used when the NICE3000 is involved in the group control system. The setting of this bit must be the same as that for all the other elevators in the group.	0
Bit6	Clear floor number and display direction in advance	The displayed floor number is cleared before the elevator reaches the target floor. If the elevator needs to change the direction, the changed direction is displayed in advance.	0
Bit8	Single hall call button	It is applied to applications where there is only one hall call button.	0
Bit9	Not detecting analog wire breaking	The system does not detect analog wire breaking during normal running.	0
Bit10	Err30 judgment at re-leveling cancellation	It indicates Err30 judgment when re-leveling is cancelled.	0
Bit14	Time interval detection of safety circuit 2 and door lock circuit 2	If the states of safety circuits 1 and 2 or the states of door lock circuits 1 and 2 are inconsistent, the system will prohibit running. After the states restore normal, the system is powered on again and starts running.	0

◆ F6-11 Elevator Function Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-11	Elevator function selection	0–65535	8448	-	★

F6-11 is used to select the elevator functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-11 are described in the following table.

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	Cancelling 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.	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	Fault auto reset	The controller automatically resets the faults once every hour.	0
Bit13	Err53 fault auto reset	When Err53 is reported, if the conditions of door open limit valid and door lock release are satisfied, the controller resets Err53 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
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

◆ F6-40 Program Control Selection 1

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-40	Program control selection 1	0–65535	0	-	★

F6-40 is used to select program control functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-40 are described in the following table.

Bit	Function	Description	Default
Bit0	Disability function	It is used to enable or disable the disability function.	0
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	This function is enabled if the opposite door function is used. 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 mode 2 (hall call independent, opposite-door manual control). 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 HCB-B extended input includes "Single/Double door selection". If this input is active, 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	-	0
Bit8	Reserved	-	0
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 (folding command not required).	0
Bit13	Folding command used as disability function and back door function	It is valid only when the function of Bit14 is enabled. Bit13 = 1: Disability Bit13 = 0: Back door	0

Bit	Function	Description	Default
Bit14	Car call command folding	Function disabled: CN7 is used for front door calls or ordinary calls, and CN8 is used for back door calls or disability calls. 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	JP20 is used for input of switchover between the front door and the back door.	0

◆ F6-41 Program Control Selection 2

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-41	Program control selection 2	0–65535	0	-	★

F6-41 is used to select program control functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-41 are described in the following table.

Bit	Function	Description	Default
Bit0	Reserved	-	0
Bit1	Reserved	-	0
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	-	0
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	-	0
Bit6	Cancelling door open delay	Door open delay is cancelled when the door open delay button is pressed again.	0
Bit7	Reserved	-	0
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

Function Code	Parameter Name	Setting Range	Default	Unit	Property
F6-42	Program control selection 3	0–65535	0	-	★

F6-42 is used to select program control functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of F6-42 are described in the following table.

Bit	Function	Description	Default
Bit0	Reserved	-	0
Bit1	Cancelling door open/close command at delay after door open/close limit	Bit1 = 1: The door open/close command is cancelled 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	Bit5 = 1: After the elevator lock signal becomes active, the elevator clears all car calls and hall calls and lands at the elevator base floor. Bit5 = 0: After the elevator lock signal becomes active, the elevator clears hall calls and responds to all registered car calls, and then lands at the elevator base floor.	0

◆ FC-00 Program Control for Protection Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-00	Program control for protection function	0–65535	0	-	★

FC-00 is used to set program control related to protection functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of FC-00 are described in the following table.

Bit	Function	Description	Default
Bit0	Short circuit to ground detection 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.	0

Bit	Function	Description	Default
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
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
Bit10	Light-load input	Input signal 24/56 is used for light-load input.	0

◆ FC-01 Program Control 2 for Protection Function

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FC-01	Program control 2 for protection function	0–65535	65	-	★

FC-01 is used to set program control related to protection functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of FC-01 are described in the following table.

Bit	Function	Description	Default
Bit0	Overload protection	It sets whether to implement overload protection.	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 to Bit8	Reserved	-	0
Bit14	Canceling protection at input phase loss	It sets whether to implement protection at input phase loss.	0

◆ FE-32 Elevator Function Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-32	Elevator function selection	0–65535	34816	-	☆

FE-32 is used to select the elevator functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of FE-32 are described in the following table.

Bit	Function	Description	Default
Bit0 to 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

◆ FE-33 Elevator Function Selection

Function Code	Parameter Name	Setting Range	Default	Unit	Property
FE-33	Elevator function selection	0–65535	36	-	☆

FE-33 is used to select the elevator functions. Each bit of the function code defines a function, as described in the following table.

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. For details on how to view and set this function code, see the descriptions in section 8.21.1.

The functions defined by the binary bits of FE-33 are described in the following table.

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

Bit	Function	Description	Default
Bit3	Reserved	-	0
Bit4	Auto reset for RUN and brake contactor stuck	If the feedback of the RUN and brake contactors is abnormal, faults Err36 and Err37 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	NO/NC output selection of shorting motor stator contactor	Bit8 = 0: NC output contactor Bit8 = 1: NO output contactor	0
Bit9	Immediate stop upon re-leveling	The elevator decelerates to stop immediately after receiving a single leveling signal during re-leveling. By default, when receiving a leveling signal, the elevator stops after the re-leveling stop delay set in Fd-05.	0
Bit10 to Bit12	Reserved	-	0
Bit13	High-speed elevator protection function	A maximum allowable speed is set when the car is in the slow-down 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	For details, see section 6.2.4.	0

9

Troubleshooting

Chapter 9 Troubleshooting

§ Safety Information

DANGER
Do not wire the controller while the power is on, and keep all circuit breakers in OFF state. Failure to comply may result in electric shock.

WARNING

- Make sure to ground the controller according to local laws and regulations. Failure to comply may result in electric shock or a fire.
- Never remove the protective cover or touch the internal circuit while the power is on. Failure to comply may result in electric shock.
- Never allow unqualified personnel to perform any maintenance, inspection or part replacement work.
- When installing the controller inside the enclosed cabinet, use the cooling fan or air conditioner to keep the air inlet temperature below 50°C. Failure to comply may result in overheating or even a fire.
- Tighten all screws based on the stated tightening torque. Failure to comply may result in electric shock or a fire.
- Always confirm the input voltage is within the nameplate rating. Failure to comply may result in electric shock or a fire.
- Keep flammable and combustible materials away from the controller.

CAUTION

- Never transporting the controller by carrying the front cover. Otherwise, the main body of the controller may fall off, resulting in personal injury.
- Always handle the controller with care.
- Do not use the controller if there are damaged or missing parts.
- 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.

9.1 Description of Fault Levels

The NICE3000new has almost 60 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 9-1 Fault levels

Category	Action	Remarks
Level 1	1. Display the fault code. 2. Output the fault relay action command.	1A: The elevator running is not affected on any condition.
Level 2	1. Display fault code. 2. Output the fault relay action command. 3. Continue normal running of the elevator.	2A: The parallel/group control function is disabled. 2B: The door pre-open/re-leveling function is disabled.
Level 3	1. Display the fault code. 2. Output the fault relay action command. 3. 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	1. Display the fault code. 2. Output the fault relay action command. 3. In distance control, the elevator decelerates to stop and cannot run again.	4A: In low-speed running, the elevator stops under 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	1. Display the fault code. 2. Output the fault relay action command. 3. 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.

9.2 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.

Table 9-2 Fault codes and troubleshooting

<table>
<tr><th>Fault Code</th><th>Name</th><th>Possible Causes</th><th>Solution</th><th>Level</th></tr>
<tr><td>Err02</td><td>Overcurrent during acceleration</td><td>● The main circuit output is grounded or short circuited.
● Motor auto-tuning is performed improperly.
● The encoder signal is incorrect.</td><td rowspan="3">1. Check the contactors:
● Check whether the RUN contactor at the controller output side is normal.
● Check whether the shorting PMSM stator contactor causes short circuit at the controller output side.
2. Check motor cables:
● Check whether the motor cables have damaged jacket, possibly short circuited to ground, and connected securely.
● Check insulation of motor power terminals, and check whether the motor winding is short circuited or grounded.
3. Check motor parameters:
● Check whether motor parameters comply with the nameplate.
● Perform motor auto-tuning again.
4. Check the encoder:
● 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 asynchronous motor, perform SVC and compare the current to judge whether the encoder works properly.</td><td>5A</td></tr>
<tr><td>Err03</td><td>Overcurrent during deceleration</td><td>● The main circuit output is grounded or short circuited.
● Motor auto-tuning is performed improperly.
● The deceleration rate is too short.
● The encoder signal is incorrect.</td><td>5A</td></tr>
<tr><td>Err04</td><td>Overcurrent at constant speed</td><td>● The main circuit output is grounded or short circuited.
● Motor auto-tuning is performed properly.
● The encoder is seriously interfered with.</td><td>5A</td></tr>
</table>

Fault Code	Name	Possible Causes	Solution	Level
Err05	Overvoltage during acceleration	● The input voltage is too high. ● The regeneration power of the motor is too high. ● The braking resistance is too large, or the braking unit fails. ● The acceleration rate is too short.	1. Check whether the input voltage is too high. Observe whether the bus voltage is too high (normal: 540–580 V for 380 voltage input). 2. Check for the balance coefficient. 3. Check whether the bus voltage rises too quickly during running. If yes, the regen. resistor does not work or its model is improper: ● Check whether the cable connecting the regen. 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 regen. resistor. ● If a braking unit is used, check whether the braking unit works properly and whether the model is proper. 4. If the resistance of the regen. 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. 5. Check whether the acceleration/ deceleration rate is too short when Err05 and Err06 is reported.	5A
Err06	Overvoltage during deceleration	● The input voltage is too high. ● The braking resistance is too large, or the braking unit fails. ● The deceleration rate is too short.		5A
Err07	Overvoltage at constant speed	● The input voltage is too high. ● The braking resistance is too large, or the braking unit fails.		5A
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 us or directly our agent.	5A
Err09	Undervoltage	● Instantaneous power failure occurs on the input power supply. ● The input voltage is too low. ● The drive control board fails.	● Check whether the external power voltage is too low. ● Check whether the power fails during running. ● Check whether wiring of all power input cables is secure. ● Contact us or directly our agent.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err10	Controller overload	● This fault is reported generally when the controller runs at the current higher than the rated value for a long time. The causes include: ● The mechanical resistance is too large. ● The balance coefficient is improper. ● The encoder feedback signal is abnormal. ● Motor auto-tuning is not performed properly (the elevator running current is higher than the normal in this case).	1. Eliminate mechanical problems: ● Check whether the brake is released, and whether the brake power supply is normal. ● Check whether the balance coefficient is proper. ● Check whether the guide shoes are too tight. 2. Check the motor auto-tuning result: ● Check whether the encoder feedback signal and parameter setting are correct, and whether the initial angle of the encoder for the PMSM is correct. ● Check the motor parameter setting and perform motor auto-tuning again. 3. If this fault is reported when the slip experiment is carried on, perform the slip experiment by using the function set in F3-24.	4A
Err11	Motor overload	● FC-02 is set improperly. ● The mechanical resistance is too large. ● The balance coefficient is improper.	● Restore FC-02 to the default value. ● Refer to the solution of Err10.	3A
Err12	Power supply phase loss	● The power input phases are not symmetric. ● The drive control board fails.	● Check whether the three phases of power supply are balanced and whether the power voltage is normal. If not, adjust the power supply. ● Contact us or directly our agent.	4A
Err13	Power output phase loss	● The output wiring of the main circuit is loose. ● The motor is damaged.	● Check whether the motor wiring is secure. ● Check whether the RUN contactor on the output side is normal. ● Eliminate the motor fault.	4A
Err14	Module overheat	● The ambient temperature is too high. ● The fan is damaged. ● The air filter is clogged.	● Lower the ambient temperature. ● Clear the air filter. ● Replace the damaged fan. ● Check whether the installation clearance of the controller satisfies the requirement.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err15	Output abnormal	● Braking (resistor) short occurs on the output side. ● The RUN contactor is abnormal.	● 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. ● Contact us or directly our agent.	5A
Err16	Current control fault	● Subcodes 1, 2: The current deviation is too large. ● Subcode 3: The speed deviation is too large.	Subcodes 1, 2: ● 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. Subcode 3: ● Check the circuit of the encoder: 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 motor parameters are correct, and perform motor auto-tuning again. ● Increase the torque upper limit in F2-08.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err17	Encoder interference during motor auto-tuning	● Subcode 1: Reserved. ● Subcode 2: The SIN/COS encoder signal is abnormal. ● Subcode 3: The UVW encoder signal is abnormal.	Subcode 2: ● Serious interference exists in the C, D, and Z signals of the SIN/COS encoder. Check whether the encoder c cable is laid separately from the power cables, and whether system grounding is reliable. ● Check whether the PG card is wired correctly. Subcode 3: ● Serious interference exists in the U, V, and W signals of the UVW encoder. Check whether the encoder c cable is laid separately from the power cables, and whether system grounding is reliable. ● Check whether the PG card is wired correctly.	5A
Err18	Current detection fault	The drive control board fails.	Contact us or directly our agent.	5A
Err19	Motor auto-tuning fault	● Subcode 1: Learning the stator resistance fails. ● Subcodes 5, 6: Learning the magnetic pole position fails. ● Subcode 8: Reserved. ● Subcode 11: Saving the angle fails at synchronous motor angle-free auto-tuning. ● Subcodes 101, 102: Motor auto-tuning fails.	Subcodes 1, 5, 6: Check the motor wiring and whether phase loss occurs on the contactor at the output side. Subcode 11: At angle-free motor auto-tuning, the power is cut off when the motor rotary displacement is too small, and this fault is reported at direct running upon power-on again. To rectify the fault, perform angle-free motor auto-tuning again and make the motor runs for consecutive three revolutions. Subcode 101: ● Synchronous motor with-load auto-tuning times out. ● Check encoder wiring is correct, or replace the PG card and perform motor auto-tuning again. Subcode 102: ● Motor auto-tuning times out in operation panel control mode. ● Check encoder wiring is correct, or replace the PG card and perform motor auto-tuning again.	5A

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. ● Subcode 2: Reserved. ● Subcode 3: The phase sequence of the motor is incorrect. ● Subcode 4: Z signal cannot be detected during synchronous motor auto-tuning. ● Subcode 5: The cables of the SIN/COS encoder break. ● Subcode 7: The cables of the UVW encoder break. ● Subcode 8: Reserved ● Subcode 9: The speed deviation is too large. ● Subcode 10, 11: Reserved. ● Subcode 12: The encoder AB signals are lost at startup. ● Subcode 13: The encoder AB signals are lost during running. ● Subcodes 14–18: Reserved. ● Subcode 19: The signals of the SIN/COS encoder are seriously interfered with during running. ● Subcode 55: The signals of the SIN/COS encoder are seriously interfered with or CD signals are incorrect during motor auto-tuning.	Subcode 1, 4, 5, 7: ● Check whether the encoder signal circuit is normal. ● Check whether the PG card is normal. Subcode 3: Exchange any two phases of the motor UVW cables. Subcode 9: ● The angle of the synchronous motor is abnormal. Perform motor auto-tuning again. ● The speed loop proportional gain is small or integral time is large. Increase the proportional gain or decrease the integral time properly. Subcode 12: ● 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: 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 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 encoder analog signals are seriously interfered with during motor auto-tuning, or encoder CD signals are in wrong sequence.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err22	Leveling signal abnormal	● Subcode 101: The leveling signal is stuck. ● Subcode 102: The leveling signal is lost. ● Subcode 103: The leveling position deviation is too large in elevator auto-running state.	Subcodes 101, 102: ● Check whether the leveling and door zone sensors work properly. ● Check the installation verticality and depth of the leveling plates. ● Check the leveling signal input points of the MCB. Subcode 103: Check whether the steel rope slips.	1A
Err23	Motor short circuit to ground	Short circuit to ground exists on the motor side.	Check whether short circuit to ground exists on the motor side.	5A
Err24	RTC clock fault	Subcode 101: The RTC clock information of the MCB is abnormal.	Subcode 101: ● Replace the clock battery. ● Replace the MCB.	3B
Err25	Storage data abnormal	Subcodes 101, 102: The storage data of the MCB is abnormal.	Subcodes 101, 102: Contact us or directly our agent.	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
Err29	Shorting PMSM stator contactor feedback abnormal	Subcode 101: Feedback of the shorting PMSM stator contactor is abnormal.	Subcode 101: ● 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 PMSM stator contactor.	5A
Err30	Elevator position abnormal	Subcodes 101, 102: In the normal-speed running or re-leveling running mode, the running time is larger than the smaller of F9-02 and (FA-38 + 10), but the leveling signal has no change.	Subcodes 101, 102: ● 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. ● Check whether signal loss exists in the encoder circuits.	4A

Fault Code	Name	Possible Causes	Solution	Level
Err33	Elevator speed abnormal	● Subcode 101: The detected running speed during normal-speed running exceeds the limit. ● Subcode 102: The speed exceeds the limit during inspection or shaft auto-tuning. ● Subcode 103: The speed exceeds the limit in shorting stator braking mode. ● Subcode 104: The speed exceeds the limit during emergency running. ● Subcode 105: The emergency running time protection function is enabled (set in Bit8 of F6-45), and the running time exceeds 50s, causing the timeout fault.	Subcode 101: ● Check whether the parameter setting and wiring of the encoder are correct. ● Check the setting of motor nameplate parameters. Perform motor auto-tuning again. Subcode 102: Attempt to decrease the inspection speed or perform motor auto-tuning again. Subcode 103: Check whether the shorting PMSM stator function is enabled. Subcodes 104, 105: ● Check whether the emergency power capacity meets the requirements. ● Check whether the emergency running speed is set properly.	5A
Err34	Logic fault	Logic of the MCB is abnormal.	Contact us or directly our agent to replace the MCB.	5A
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, ● 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. ● Subcodes 104, 113, 114: In distance control mode, it is judged at running startup that shaft auto-tuning is not performed. (To be continued)	1. Handling at inspection-speed commissioning: Err35 (subcode 103) is reported at each power-on because shaft auto-tuning is not performed before inspection-speed commissioning. This fault does not affect inspection-speed commissioning and you can hide the fault directly on the operation panel. 2. Handling at normal-speed commissioning and running: Subcode 101: Check that the down slow-down switch is valid, and that F4-01 (Current floor) is set to the bottom floor number. Subcode 102: Check that the inspection switch is turned to inspection state. Subcodes 103, 104, 113, 114: Perform shat auto-tuning again. (To be continued)	4C

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<table>
<tr><th>Fault Code</th><th>Name</th><th>Possible Causes</th><th>Solution</th><th>Level</th></tr>
<tr><td>Err35</td><td>Shaft auto-tuning data abnormal</td><td>● Subcode 105: The elevator running direction and the pulse change are inconsistent.
● Subcodes 106, 107, 109: The plate pulse length sensed at up/down leveling is abnormal.
● Subcodes 108, 110: No leveling signal is received within 45s continuous running.
● Subcodes 111, 115: The stored floor height is smaller than 50 cm.
● Subcode 112: The floor when auto-tuning is completed is not the top floor.
(End)</td><td>Subcode 105:
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. If not, change the value of F2-10 to ensure consistency.
Subcode 106, 107, 109:
● Check that NO/NC state of the leveling sensor is set correctly.
● Check whether the leveling plates are inserted properly and whether there is strong power interference if the leveling sensor signal blinks.
● Check whether the leveling plate is too long for the asynchronous motor.
Subcodes 108, 110:
● Check whether wiring of the leveling sensor 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:
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 sensor.
Subcode 112:
Check whether the setting of F6-00 (Top floor of the elevator) is smaller than the actual condition.
(End)</td><td>4C</td></tr>
</table>

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. ● Subcode 102: The controller outputs the RUN signal but receives no RUN feedback. ● Subcode 103: The startup current of the asynchronous motor is too small. ● Subcode 104: When both feedback signals of the RUN contactor are enabled, their states are inconsistent.	Subcodes 101, 102, 104: ● Check whether the feedback contact of the contactor acts properly. ● Check the signal feature (NO, NC) of the feedback contact. Subcode 103: ● Check whether the output cables UVW of the controller are connected properly. ● Check whether the control circuit of the RUN contactor coil is normal.	5A
Err37	Brake contactor feedback abnormal	● Subcode 101: The output of the brake contactor is inconsistent with the feedback. ● Subcode 102: When both feedback signals of the brake contactor are enabled, their states are inconsistent. ● Subcode 103: The output of the brake contactor is inconsistent with the brake travel switch 1 feedback. ● Subcode 104: When both feedback signals of brake travel switch 1 are enabled, their states are inconsistent. ● Subcode 105: The brake contactor feedback is valid before the brake contactor opens. ● Subcode 106: The output of the brake contactor is inconsistent with the brake travel switch 2 feedback. ● Subcode 107: When both feedback signal of brake travel switch 2 are enabled, their states are inconsistent.	Subcode 101: ● Check whether the brake contactor opens and closes properly. ● Check 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. Subcode 102: ● Check whether the signal feature (NO, NC) of the multi-way contacts is set correctly. ● Check whether the states of the multi-way feedback contacts are consistent. Subcode 103, 105: ● Check whether the signal feature (NO, NC) of the brake travel switch 1/2 feedback is set correctly. ● Check whether the circuit of the brake travel switch 1/2 feedback is normal. Subcode 104, 107: ● Check whether the signal feature (NO, NC) of the brake travel switch 1/2 feedback is set correctly. ● Check whether the states of the multi-way feedback contacts are consistent. Subcode 105: Check whether the feedback contact of the brake contactor mal-functions.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err38	Encoder signal abnormal	● Subcode 101: The pulses in F4-03 does not change within the time threshold in of F1-13. ● Subcode 102: F4-03 increases in down direction. ● Subcode 103: F4-03 decreases in up direction. ● Subcode 104:The SVC is used in distance control mode.	Subcode 101: ● Check whether the encoder is used correctly. ● Check whether the brake works properly. Subcodes 102, 103: Check whether parameter setting and wiring of the encoder are correct. Subcode 104: Set F0-00 (Control mode) to 1 (Closed-loop vector control) in distance control mode.	5A
Err39	Motor overheat	Subcode 101: The motor overheat relay input remains valid for a certain time.	Subcode 101: ● 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	-	-	-
Err41	Safety circuit disconnected	Subcode 101: The safety circuit signal becomes OFF.	Subcode 101: ● 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.	Subcodes 101, 102: ● 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.	Subcode 101: ● 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.	4C
Err44	Down limit signal abnormal	Subcode 101: The down limit switch acts when the elevator is running in the down direction.	Subcode 101: ● 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.	4C
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.	Subcodes 101 to 103: ● Check whether the up slow-down switch and the down slow-down switch 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
Err46	Re-leveling abnormal	● Subcode 101: The leveling signal is inactive during re-leveling. ● Subcode 102: The re-leveling running speed exceeds 0.1 m/s. ● Subcode 103: At startup of normal-speed running, the re-leveling state is valid and there is shorting door lock circuit feedback.. ● Subcode 104: During re-leveling, no shorting door lock circuit feedback or door lock signal is received 2s after shorting door lock circuit output.	Subcode 101: Check whether the leveling signal is normal. Subcode 102: Check whether the encoder is used properly. Subcodes 103, 104: ● Check whether the signal of the leveling sensor is normal. ● Check the signal feature (NO, NC) of the feedback contact on the shorting door lock circuit contactor, and check the relay and wiring of the SCB-A board.	2B

Fault Code	Name	Possible Causes	Solution	Level
Err47	Shorting door lock circuit contactor abnormal	● Subcode 101: During re-leveling or pre-open running, the shorting door lock circuit contactor outputs for continuous 2s, but the feedback is invalid and the door lock is disconnected. ● Subcode 102: During re-leveling or pre-open running, the shorting door lock circuit contactor has no output, but the feedback is valid for continuous 2s. ● Subcode 103: During re-leveling or pre-open running, the output time of the shorting door lock circuit contactor is larger than 15s.	Subcodes 101, 102: ● 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. Subcode 103: ● Check whether the leveling and re-leveling signals are normal. ● Check whether the re-leveling speed is set too low.	2B
Err48	Door open fault	Subcode 101: The consecutive times that the door does not open to the limit reaches the setting in Fb-09.	Subcode 101: ● 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 open to the limit reaches the setting in Fb-09.	Subcode 101: ● 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.	Subcodes 101, 102: ● Check whether the leveling and door zone sensors 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

Fault Code	Name	Possible Causes	Solution	Level
Err51	CAN communication abnormal	Subcode 101: Feedback data of CANbus communication with the CTB remains incorrect.	1. Handling at inspection-speed commissioning: This fault does not affect inspection-speed commissioning and you can hide the fault directly on the operation panel. 2. Handling at normal-speed commissioning and running: Subcode 101: ● Check the communication cable connection. ● 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.	1. Handling at inspection-speed commissioning: This fault does not affect inspection-speed commissioning and you can hide the fault directly on the operation panel. 2. Handling at normal-speed commissioning and running: Subcode 101: ● 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. ● Subcode 102: The states of the door lock multi-way feedback contacts are inconsistent 3s after door open output. ● Subcode 103: Reserved. ● Subcode 104: The higher-voltage and low-voltage door lock signals are inconsistent.	Subcode 101: ● Check whether the door lock circuit is normal. ● Check whether the feedback contact of the door lock contactor acts properly. ● Check whether the system receives the door open limit signal when the door lock signal is valid. Subcode 102: Check whether when the hall door lock signal and the car door lock signal are detected separately, the detected states of the hall door locks and car door lock are inconsistent. Subcode 104: ● When the higher-voltage and low-voltage door lock signals are detected at the same time, the time when the MCB receives the two signals has a deviation of above 1.5s. This causes system protection. ● This subcode is reset at power-off and power-on again.	5A
Err54	Overcurrent at inspection startup	● Subcode 101: reserved ● Subcode 102: The current at startup for inspection exceeds 120% of the rated current.	Subcode 102: ● Reduce the load ● Change Bit1 of FC-00 to 1 to cancel the startup 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.	Subcode 101: Check the door open limit signal at the present floor.	1A
Err57	Serial peripheral interface (SPI) communication abnormal	● Subcodes 101, 102: The SPI communication is abnormal. No correct data is received with 2s of DSP communication. ● Subcode 103: The MCB does not match the AC drive.	Subcodes 101, 102: Check the wiring between the control board and the drive board. Subcode 103: Contact us or directly our agent.	5A

Fault Code	Name	Possible Causes	Solution	Level
Err58	Shaft position switches abnormal	● Subcode 101: The up slow-down switch and down slow-down switch are disconnected simultaneously. ● Subcode 102: The up limit feedback and down limit feedback are disconnected simultaneously.	Subcodes 101, 102: ● 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
Err62	Analog input cable broken	Subcode 101: The current car load (F8-05) is smaller than the car no-load load (F8-06) and the deviation is larger than the threshold.	Subcode 101: ● 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.	1A

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.

10

Technical Data

Chapter 10 Technical Data

10.1 General Technical Specifications

Table 10-1 NICE3000new technical specifications

Item		Specification
Basic specifications	Maximum frequency	99 Hz
	Carrier frequency	2–16 kHz, adjusted automatically based on the load features
	Motor control mode	● Sensorless vector control (SVC) ● Closed-loop vector control (CLVC) ● Voltage/Frequency (V/F) control
	Startup torque	● 0.5 Hz: 180% (SVC) ● 0 Hz: 200% (CLVC)
	Speed adjustment range	● 1:100 (SVC) ● 1:1000 (CLVC) ● 1:50 (V/F)
	Speed stability accuracy	● ±0.5% (SVC) ● ±0.05% (CLVC)
	Torque control accuracy	±5% (CLVC)
	Overload	60s for 150% of the rated current, 1s for 200% of the rated current
	Motor auto-tuning	With-load auto-tuning; no-load auto-tuning
	Distance control	Direct travel ride mode in which the leveling position can be adjusted flexibly
	Acceleration/ Deceleration curve	N curves generated automatically
	Slow-down	New reliable slow-down function, automatically identifying the position of the slow-down shelf
	Shaft auto-tuning	32-bit data, recording the position in the shaft accurately
	Leveling adjustment	Flexible and easy leveling adjustment function
	Startup torque compensation	● Load cell startup pre-torque compensation ● No-load-cell startup pre-torque self-adaption
	Real-time clock	Real-time clock for time-based floor service, peak service and automatic password
	Test function	Easy to implement multiple elevators commissioning functions.
	Fault protection	Solutions to different levels of elevator faults
	Intelligent management	Remote monitoring, user management, and group control adjustment
	Security check of peripheral devices after power-on	Security check of peripheral devices, such as grounding and short circuit, after power-on
	Status monitor	Monitoring the state of feedback signals to ensure that the elevator works properly

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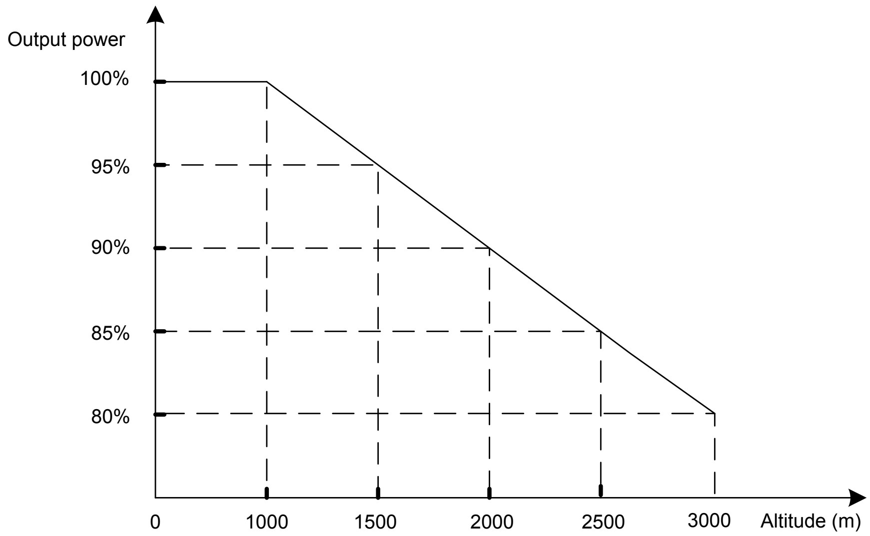
Item		Specification
I/O feature	Digital input (DI)	24 x DI Input specification: 24 V, 5 mA
		3 heavy-current detection input terminals of safety circuit and door lock circuit Input specification: 95−125 V
	Analog input (AI)	AI (voltage range: –10 V to +10 V)
	Communication port	2 CANbus communication ports 1 Modbus communication port
	Output terminal block	6 relay outputs The terminals can be allocated with different functions.
	Encoder interface	Supporting different encoders by using an optional PG card
Operation and display	Keypad	3-digit LED display, implementing certain commissioning functions
	LED operation panel	5-digit LED display, querying/modifying most parameters and monitoring the system state
	Status monitor	Connecting the control system and the host computer, convenient for querying/motoring the system state.
Environment	Altitude	Below 1000 m (de-rated 1% for each 100 m higher)
	Ambient temperature	–10°C to 40°C (de-rated if the ambient temperature is above 40°C, maximum temperature: 50°C)
	Humidity	Maximum relative humidity 95%, non-condensing
	Vibration	Maximum vibration: 5.9 m/s^2 (10–55 Hz, 0.35 mm)
	Storage temperature	–20°C to 60°C
	IP level	IP20
	Pollution degree	PD2
	Power distribution system	TN, TT

10.2 Derating

As the altitude increases, the output power of the NICE3000new must be derated according to the following figure.

Figure 10-1 Derating and NICE3000new output power



10.3 Comparison with NICE3000

Item	NICE3000	NICE3000new
Maximum number of floors	31 (standard)	40 (standard)
Maximum elevator speed	4 m/s	4 m/s
I/O terminals	24 inputs, 6 outputs	24 inputs, 6 outputs, 3 higher-voltage inputs
CANbus	1 x CANbus	2 x CANbus
Modbus	1 x Modbus	1 x Modbus
Motor driving type	Separate control for synchronous and asynchronous motors	Integrated control for synchronous and asynchronous motors
No-load-cell startup	Supporting SIN/COS encoder only	Supporting: ● Push-pull encoder ● Open-collector incremental encoder ● UVW encoder ● SIN/COS encoder ● Endat encoder
Control mode	Sensorless vector control (SVC) Closed-loop vector control (CLVC)	● Sensorless vector control (SVC) ● Closed-loop vector control (CLVC) ● Voltage/Frequency (V/F) control
Inside-car commissioning	Not support	Support

11

Inspection and Mainetenance

Chapter 11 Inspection and Mainetenance

§ 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.
- Installation, wiring, commissioning, inspection & maintenance, and component replacement must be performed only by qualified technicians.

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 chapter.
- 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.
- If it is necessary to change the motor rotation direction, exchange any two of the controller U, V, W cables.
- Never operate the controller that has been damaged.
- This is to prevent further damage to external equipment.

11.1 Daily Inspection

The influence of the ambient temperature, humidity, dust and vibration will cause aging of 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 periodic inspection.

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 controller. ● 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 is damaged. ● 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.	

11.2 Periodic Inspection

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.

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.

More frequent inspection will be required if it is used in harsh environments, such as:

- High ambient temperature
- Frequent starting and stopping
- Fluctuations in the AC power supply or load
- Excessive vibrations or shock
- Dust, metal dust, salt, sulfuric acid, chlorine atmospheres
- Poor storage conditions

Check the following items periodically to avoid deterioration in performance or product failure. Copy this checklist and sign the "checked" column after each inspection.

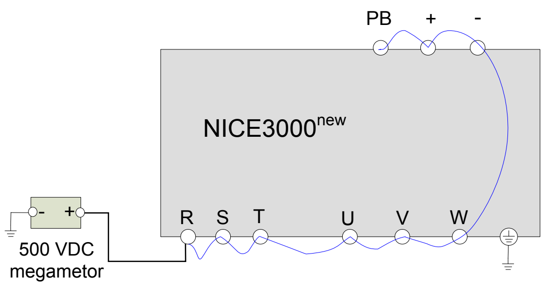
Inspection Item	Inspection Points	Correction	Checked
General	Check for wastes, dirt and dust on the surface of the controller.	● Confirm that the cabinet is powered off. ● Use a vacuum cleaner (rather than directly touch components) to suck up wastes and dust. ● Wipe the surface dirt difficult to clean 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 wears.	● 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	● 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.	

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.

The measured insulating resistance must be greater than 5 MΩ.

Figure 11-1 Main circuit insulation test



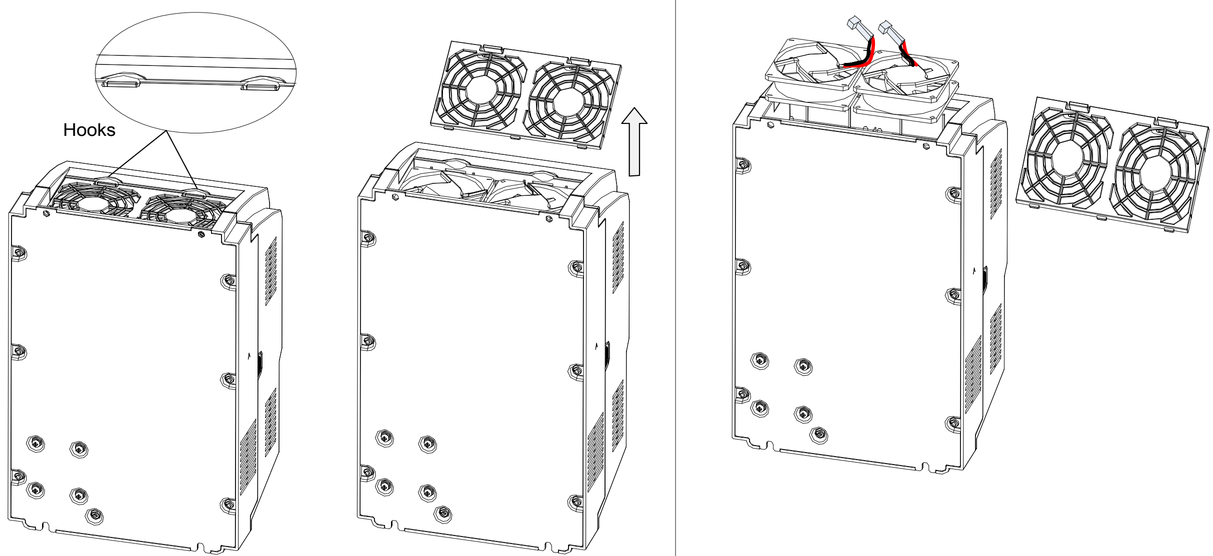
11.3 Replacement of Vulnerable Components

11.3.1 Cooling Fan

Component	Possible Cause	Judging Criteria
Cooking fan	Bearing worn Blade aging	● Whether there is crack on the blade ● Whether there is abnormal vibration noise upon startup

◆ Removing and Installing the Cooling Fan of a Plastic Housing

Removing the cooling fan	
Depress the hooks on the fan cover, and pull upward to remove the fan cover.	Lift the fan a little, disconnect the fan power cables from the socket, and then remove the fan.



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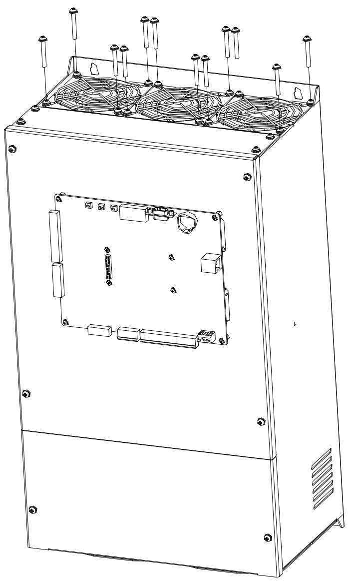
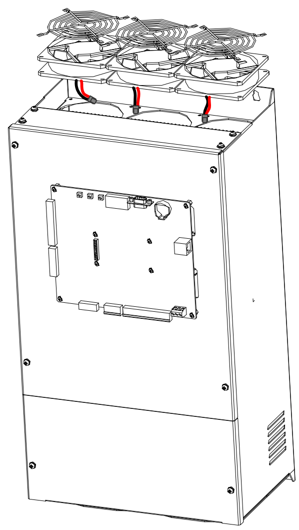
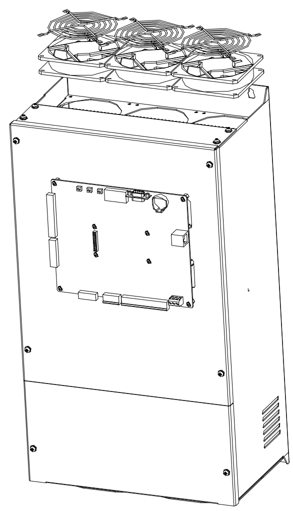
Installing the cooling fan
Reverse the procedure above to reinstall the fan.
1. Connect the fan power cable to the socket.
2. Put the fan into the controller, and ensure mounting hole alignment.
Pay attention to the direction arrow on the fan, and lay the fan in the specified direction to ensure upward 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.

◆ Removing and Installing the Fan of a Sheet Metal Housing

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. 

Installing the cooling fan
Reverse the procedure above to reinstall the fan.
Align the mounting holes on the fan with the mounting positions inside the controller.
Ensure correct air flow direction after reinstallment.

11.3.2 Electrolytic Capacitor

Component	Possible Cause	Judging Criteria	Replacement
Electrolytic capacitor	● Input power supply in poor quality ● High ambient temperature ● Frequent load jumping ● Electrolytic aging	● Whether there is liquid leakage. ● Whether the safe valve has projected. ● Measure the static capacitance. ● Measure the insulating resistance.	● Replacement of electrolytic capacitor will influence internal components of the controller. ● Do not replace the electrolytic capacitor yourself. If replacement is required, contact us.

11.4 Storage

For storage of the controller, pay attention to the following two aspects:

- Pack the controller with the original packing box provided by Monarch.
- 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.

12

EMC

Chapter 12 EMC

12.1 CE Mark

The CE mark indicates compliance with European safety and environmental regulations. It is required for engaging in business and commerce 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.

Certain NICE3000^{new} models are labeled with the CE mark based on the following EMC guidelines and the Low Voltage Directive.

- Low Voltage Directive: 2006/95/EC
- EMC Guidelines: 2004/108/EC

Machines and devices used in combination with this controller must also be CE certified and labeled
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.

12.2 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.

- Mounting Location

  Mount the controller in places with pollution not higher than severity 2 and overvoltage category 3 in accordance with IEC60664.

- 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 12-13.

  For input current and output current of the controller, refer to Table 2-1 in section 2.4.

- 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.

- Grounding

  If using an controller of the 400 V class, tie the neutral point of the controller power supply to ground.

◆ Wiring Example

For the wiring example of controller complying with the Low Voltage Directive, see Figure 3-11 in Chapter 3

12.3 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.

The controller satisfies the European EMC directive 2004/108/EC and the standard EN 61800-3: 2004 +A1: 2012 Category C2. The controllers are applied to both the first environment and the second environment.

WARNING
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.

To enable the controller to meet the EMC standard, users need to install the EMC filter on the input side of the controller, use the shielded cable as the output cables, and ensure that the filter is grounded reliably and that the shield of the output cables is 360° grounded.

The integrator of the system installed with the controller is responsible for compliance of the system with the European EMC directive and standard EN 61800-3: 2004 +A1: 2012 Category C2, C3 or C4 according to the system application environment.

12.4 Definition of Terms

- First Environment

  Environment that includes domestic premises, it also includes establishments directly connected without intermediate transformers to a low-voltage power supply network which supplies buildings used for domestic purposes.

- Second Environment

  Environment that includes all establishments other than those directly connected to a low-voltage power supply network which supplies buildings used for domestic purposes

- Category C1 Controller

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Power Controller System (PDS) of rated voltage less than 1 000 V, intended for use in the first environment

- Category C2 Controller

  PDS of rated voltage less than 1 000 V, which is neither a plug in device nor a movable device and, when used in the first environment, is intended to be installed and commissioned only by a professional person.

- Category C3 Controller

  PDS of rated voltage less than 1 000 V, intended for use in the second environment and not intended for use in the first environment

- Category C4 Controller

  PDS of rated voltage equal to or above 1 000 V, or rated current equal to or above 400 A, or intended for use in complex systems in the second environment

12.5 Selection of Peripheral EMC Devices

12.5.1 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

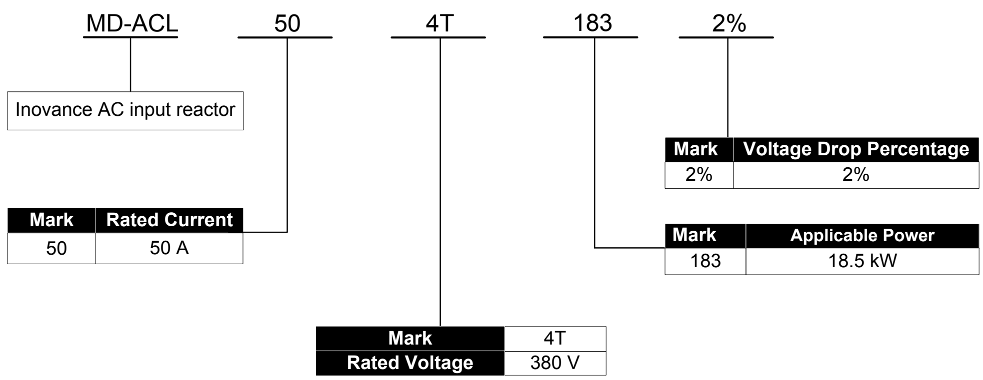
Table 12-1 Recommended AC input reactor models

Controller Model	Rated Input Current (A)	AC Reactor Model (Inovance)
Three-phase 380 V, range: 380–440 V		
NICE-L-C-4002	6.5	MD-ACL-7-4T-222-2%
NICE-L-C-4003	10.5	MD-ACL-15-4T-552-2%
NICE-L-C-4005	14.8	MD-ACL-15-4T-552-2%
NICE-L -C-4007	20.5	MD-ACL-30-4T-113-2%
NICE-L -C-4011	29.0	MD-ACL-30-4T-113-2%
NICE-L -C-4015	36.0	MD-ACL-40-4T-153-2%
NICE-L-C-4018	41.0	MD-ACL-50-4T-183-2%
NICE-L-C-4022	49.5	MD-ACL-50-4T-183-2%
NICE-L-C-4030	62.0	MD-ACL-80-4T-303-2%
NICE-L-C-4037	77.0	MD-ACL-80-4T-303-2%
NICE-L-C-4045	93.0	MD-ACL-120-4T-453-2%
NICE-L-C-4055	113.0	MD-ACL-120-4T-453-2%
NICE-L-C-4075	157.5	MD-ACL-200-4T-753-2%

Controller Model	Rated Input Current (A)	AC Reactor Model (Inovance)
NICE-L-C-4090	180.0	MD-ACL-200-4T-753-2%
NICE-L-C-4110	214.0	MD-ACL-250-4T-114-2%
NICE-L-C-4132	256.0	MD-ACL-330-4T-164-2%
NICE-L-C-4160	307.0	MD-ACL-330-4T-164-2%
Three-phase 220 V, range: 220–240 V		
NICE-L-C-2002	11.0	MD-ACL-15-4T-552-2%
NICE-L-C-2003	17.0	MD-ACL-30-4T-113-2%
220-NICE-L-C-4007	20.5	MD-ACL-30-4T-113-2%
220-NICE-L-C-4011	29.0	MD-ACL-30-4T-113-2%
220-NICE-L-C-4015	36.0	MD-ACL-50-4T-153-2%
220-NICE-L-C-4018	41.0	MD-ACL-50-4T-183-2%
220-NICE-L-C-4022	49.0	MD-ACL-50-4T-183-2%
220-NICE-L-C-4030	62.0	MD-ACL-80-4T-303-2%

2. Designation rule

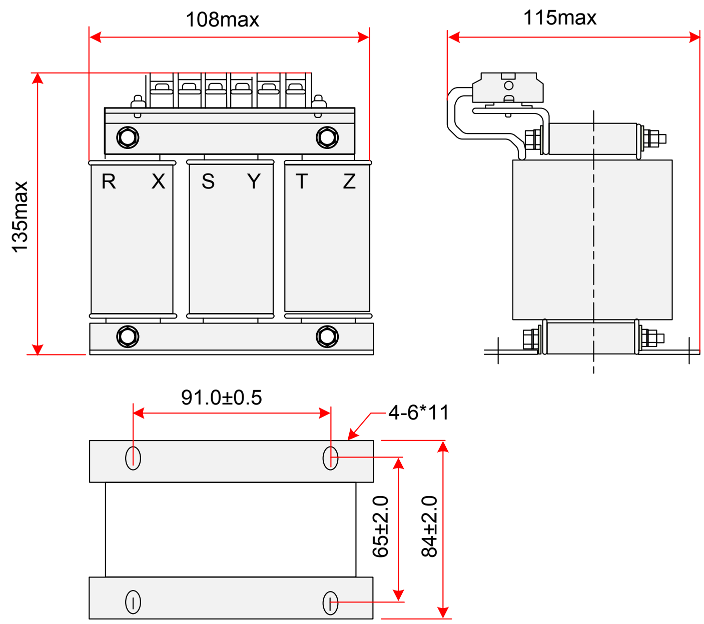
Figure 12-1 Designation rules of AC input reactor



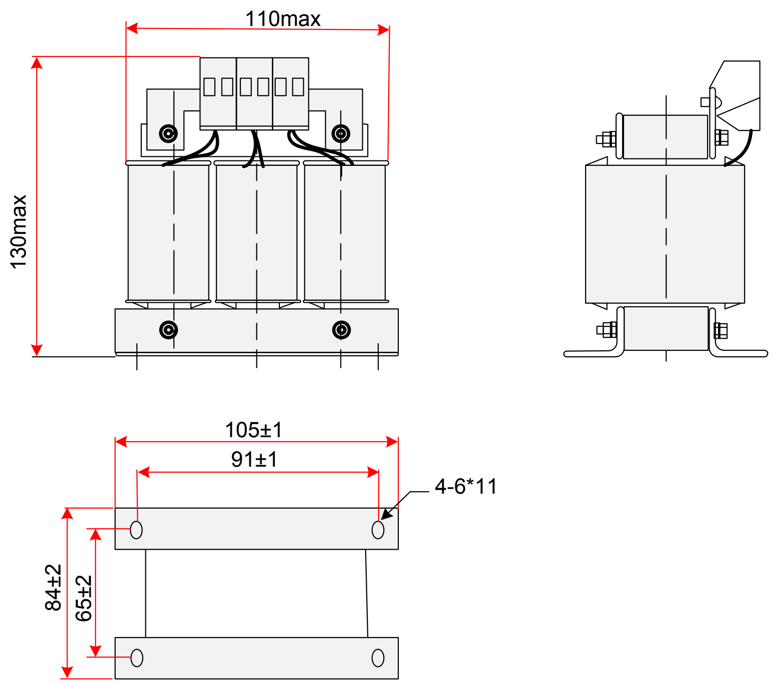
3. Physical dimensions of AC input reactor

Figure 12-2 Physical dimension diagram of 7–15 A AC input reactor

1) 7 A AC reactor



2) 10 A AC reactor



3) 15 A AC reactor

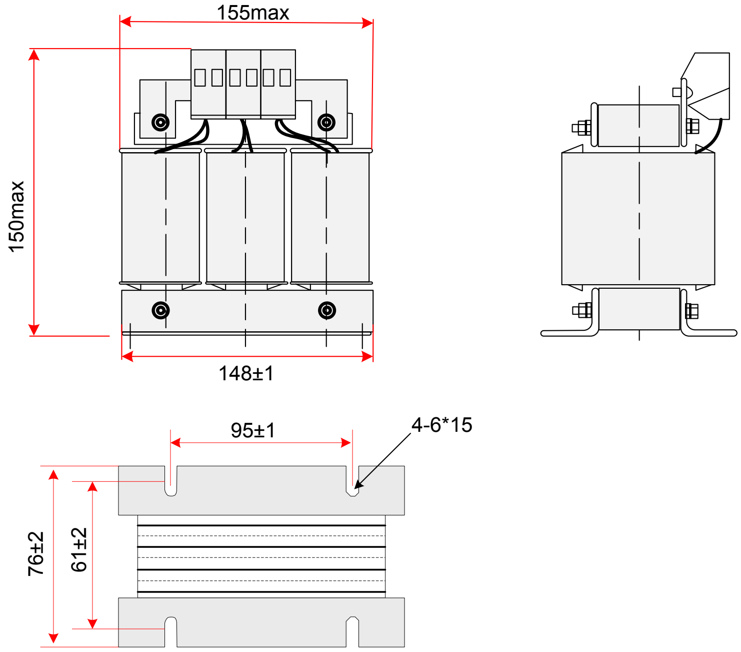


Figure 12-3 Physical dimension diagram of 30–120 A AC input reactor

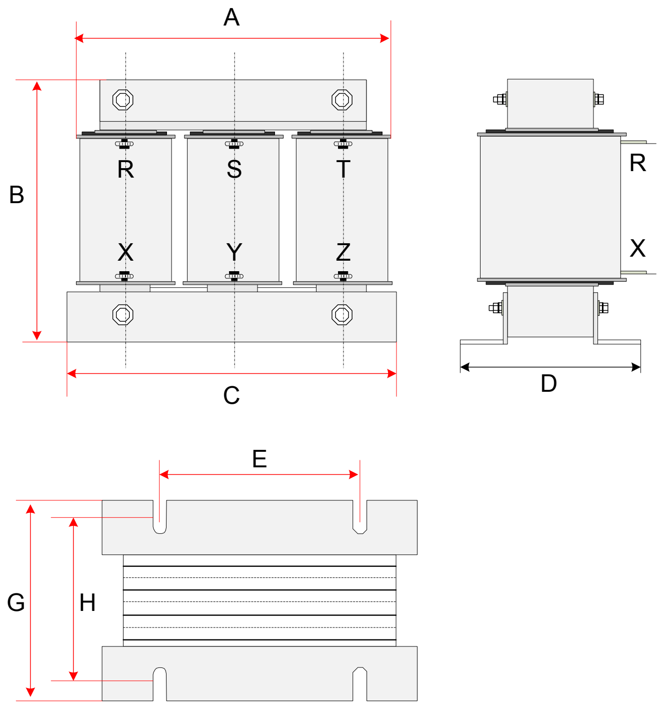


Table 12-2 Physical dimensions of 50–120 A AC reactor

Rated Current	A	B	C	D	E	F	G	H
(A)	(mm)							
30	155	130	148	150	95	6*15	95	80
40	155	130	148	150	95	6*15	95	80
50	155	130	148	150	95	6*15	95	80
80	195	160	188	150	120	8.5*20	92	72
120	195	160	188	135	120	8.5*20	112	72

Figure 12-4 Physical dimension diagram of 150–330 A AC reactor

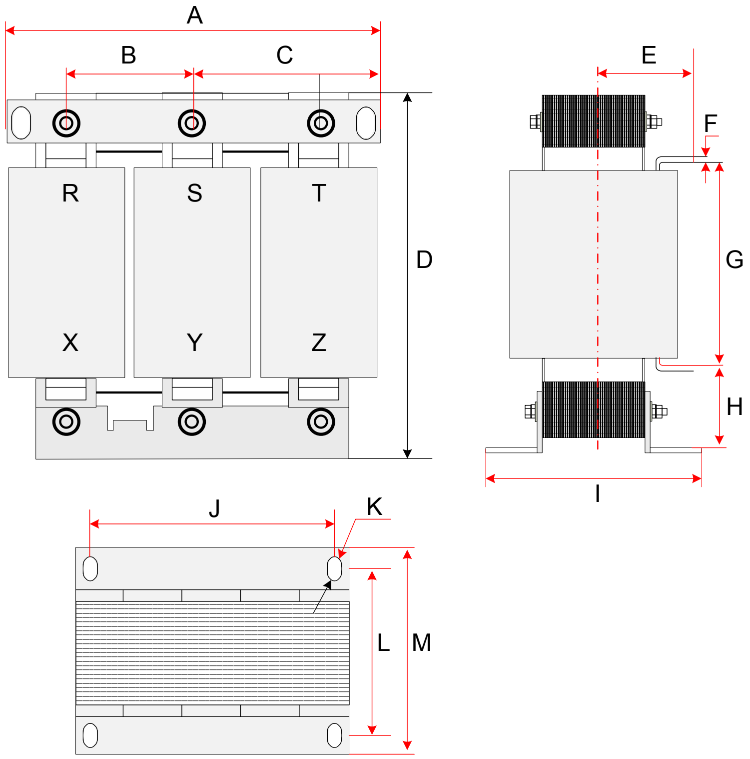


Table 12-3 Physical dimensions of 150–330 A AC reactor

Rated Current	A	B	C	D	E	F	G	H	I	J	K	L	M
(A)	(mm)												
150	250	81	81	230	92	5	140	38	155	182	11*18	76	102
200	250	81	81	230	102	5	140	40	175	182	11*18	96	122
250	250	81	81	230	102	5	155	50	175	182	11*18	96	122
330	290	95	95	275	107	5	155	60	180	214	11*18	100	126

NOTE

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

12.5.2 EMC Filter

NOTE

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.

12

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 4-2.

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

Table 12-4 Recommended standard EMC filter manufacturers and models

Controller Model	Power Capacity (kVA)	Rated Input Current	EMC Filter Model (Changzhou Jianli)	EMC 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	24.0	41.0	DL-50EBK5	FN 3258-42-33
NICE-L-C-4022	30.0	49.5	DL-50EBK5	FN 3258-55-34
NICE-L-C- 4030	40.0	62.0	DL-65EBK5	FN 3258-75-34
NICE-L-C-4037	57.0	77.0	DL-80EBK5	FN 3258-100-35
NICE-L-C-4045	69.0	93.0	DL-100EBK5	FN 3258-100-35
NICE-L-C-4055	85.0	113.0	DL-130EBK5	FN 3258-130-35
NICE-L-C-4075	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	15	41.0	DL-50EBK5	FN 3258-42-33
220-NICE-L-C-4022	18.3	49.0	DL-50EBK5	FN 3258-55-34
220-NICE-L-C-4030	23	62.0	DL-65EBK5	FN 3258-75-34
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-4022	10.6	42.6	DL-100TH1	FN 2010-60-24
220-NICE-L-C-4030	13.1	52.6	DL-100TH1	FN 2010-60-24

2. Simple EMC filter

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

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

Table 12-5 Recommended EMC filter manufacturers and models

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	MC 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-4022	30.0	49.5	DL-65EB1/10
NICE-L-C-4030	40.0	62.0	DL-65EB1/10
NICE-L-C-4037	57.0	77.0	DL-120EBK5
NICE-L-C-4045	69.0	93.0	DL-120EBK5
NICE-L-C-4055	85.0	113.0	DL-120EB1/10
NICE-L-C-4075	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	15.0	41.0	DL-65EB1/10
220-NICE-L-C-4022	18.3	49.0	DL-65EB1/10
220-NICE-L-C-4030	23.0	62.0	DL-65EB1/10

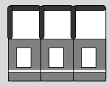
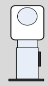
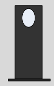
For details on the EMC filter, refer to the product documents of corresponding manufacturer.

12.5.3 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.

1. Recommended dv/dt reactor models (Schaffner)

Table 12-11 Recommended dv/dt reactor models (Schaffner)

dv/dt Reactor Model	Rated Current at 40°C (A)	Rated Power of Standard 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

12.5.4 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 12-11 Installation of the common-mode filter

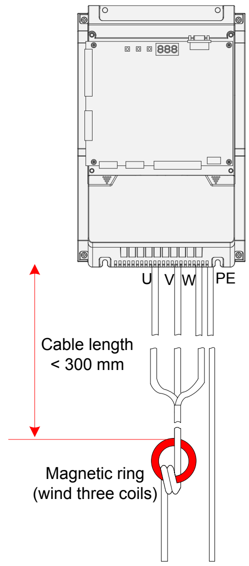


Table 12-12 Recommended common-mode filter model

Common-Mode Filter Model	SN	Dimensions (Outer Diameter x Inner Diameter x Thickness)
DY644020H	11013031	64 x 40 x 20 mm
DY805020H	11013032	80 x 50 x 20 mm
DY1207030H	11013033	120 x 70 x 30 mm

12.6 Circuit Breaker and Fuse Selection

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

The controller produces DC leakage current inside protective conductor, thus a B-type (delay-time) ELCB must be used.

When the ELCB malfunction occurs, you can:

- Use an ELCB of higher rated operating current or use a B-type ELCB.
- Reduce the carrier frequency of the AC drive.
- Shorten the length of drive cables of the motor.
- Take more leakage current suppression measures.

The recommended leakage breaker manufacturers are CHINT and Schneider.

The following table lists the recommended models of the fuse, circuit breaker, and contactor.

Table 12-13 Recommended models of the fuse, circuit breaker, and contactor.

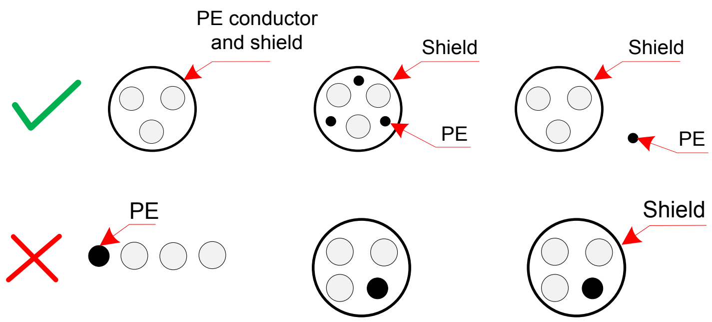
Controller Model	Fuse (Bussmann FWH Series, UL Certificated)	Circuit Breaker (A)	Contactor (A)
Single-phase 220 V, range:220–240 V, 50/60 Hz			
NICE-L-C-2002	FWH-35B	16	12
NICE-L-C-2003	FWH-35B	20	18
220-NICE-L-C-4007	FWH-35B	25	18
220-NICE-L-C-4011	FWH-40B	40	25
220-NICE-L-C-4015	FWH-50B	50	32
220-NICE-L-C-4018	FWH-60B	50	38
220-NICE-L-C-4022	FWH-70B	63	50
220-NICE-L-C-4030	FWH-80B	80	65
Three-phase 220 V, range: 220–240 V, 50/60 Hz			
NICE-L-C-2002	FWH-35B	16	12
NICE-L-C-2003	FWH-35B	25	18
220-NICE-L-C-4007	FWH-35B	32	25
220-NICE-L-C-4011	FWH-45B	40	32
220-NICE-L-C-4015	FWH-60B	50	38
220-NICE-L-C-4018	FWH-70B	63	40
220-NICE-L-C-4022	FWH-80B	80	50
220-NICE-L-C-4030	FWH-125B	100	65
Three-phase 380 V, range: 380–440 V, 50/60 Hz			
NICE-L-C-4002	FWH-35B	10	9
NICE-L-C-4003	FWH-35B	16	12
NICE-L-C-4005	FWH-35B	25	18
NICE-L-C-4007	FWH-35B	32	25
NICE-L-C-4011	FWH-45B	40	32
NICE-L-C-4015	FWH-60B	50	38
NICE-L-C-4018	FWH-70B	63	40
NICE-L-C-4022	FWH-80B	80	50
NICE-L-C-4030	FWH-100B	100	65
NICE-L-C-4037	FWH-125B	100	80
NICE-L-C-4045	FWH-150B	160	95
NICE-L-C-4055	FWH-200B	160	115
NICE-L-C-4075	FWH-275A	225	170
NICE-L-C-4090	FWH-300A	250	205
NICE-L-C-4110	FWH-350A	315	245
NICE-L-C-4132	FWH-400A	350	300
NICE-L-C-4160	FWH-500A	400	300

12.7 Shielded Cable

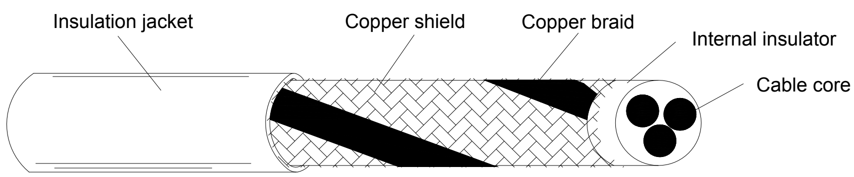
12.7.1 Shielded Cable Requirements

The shielded cable must be used to satisfy the EMC requirements of CE marking. Shielded cables are classified into three-conductor cable and four-conductor cable. If conductivity of the cable shield is not sufficient, add an independent PE cable, or use a four-conductor cable, of which one phase conductor is PE cable.

The three-conductor cable and four-conductor cable are shown in the following figure.



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 the following figure.



For grounding of the shielded cable, see section 3.2.2.

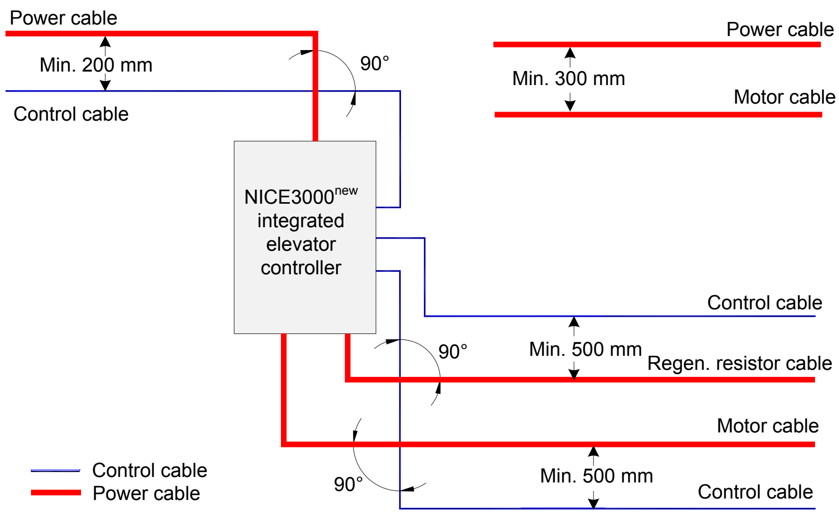
12.7.2 Cabling Requirements

- The motor cable and PE shielded conducting wire (twisted shielded) should be as short as possible to reduce electromagnetic radiation and external stray current and capacitive current of the cable. If the motor cable is over 100 meters long, an output filter or dv/dt reactor is required.
- It is recommended that all control cables use shielded cables.
- The motor cables must be far away from other cables. The motor several controllers can be laid in parallel.
- 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 other 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°. Other cables must not run across the controller.
- The power input and output cables of the controller and weak-current signal cables (such as control cable) should be laid vertically (if possible) rather than in parallel.

- The cable ducts must be in good connection and well grounded. Aluminium ducts can be used to improve electric potential.
- The filter, controller and motor should be connected to the system (machinery or appliance) properly, with spraying protection at the installation part and conductive metal in full contact.

For more cabling details, see section 3.2.

The following figure shows the recommended cabling diagram.



12.8 Solutions to Current Leakage

The controller outputs high-speed pulse voltage, producing high-frequency leakage current during running of the controller. Each controller produces above 100 mA leakage current. Therefore, it is necessary to select an ELCB with rated operating current of 100 mA 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.

The factors that influence the leakage current are as follows:

- Controller capacity
- Carrier frequency
- Type and length of motor cable
- EMI filter

When the leakage current causes the ELCB to act, you should:

- Increase the sensitivity 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 cables.
- Install a current leakage suppression device.
- Use Chint Electric and Schneider brands.

12.9 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.

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 0.11 uF capacitance is suggested. Enlarge the capacitance at the AI. A maximum of 0.22 uF is suggested.

Acronyms & Abbreviations

Acronym & Abbreviation	Expansion
AC, DC	Alternating current, direct current
AI/AO	Analog input, analog output
ARD	Automatic rescue device
CCB	Car control board
CLVC	Closed-loop vector control
CTB	Car top board
DI/DO	Digital input, digital output
ELCB	Earth leakage circuit breaker
EMI	Electromagnetic interference
ESD	Electrostatic discharge
GCB	Group control board
HCB	Hall control board
LVD	low voltage directive
MCB	Main control board
MCCB	Molded case circuit breaker
NO, NC	Normally open, normally closed
PMSM	Permanent magnetic synchronous motor
RCD	Residual current device
SPI	Serial peripheral interface
SVC	Sensorless vector control
UPS	Uninterrupted power supply
V/F	Voltage/Frequency (V/F) control

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Revision History

Date	Version	Revision
February 2013	V0.0	First issue.
March 2014	V1.0	Corrected and updated certain information.
February 2015	V1.1	Large revision, including: ● Adjusted the structure of chapters. ● Revised Chapter 3, 6, and 8 greatly. ● Added descriptions of HCB and GCB and more other details.

Warranty Agreement

1. The warranty period of the product is 18 months from date of manufacturing. During the warranty period, if the product fails or is damaged under the condition of normal use by following the instructions, Inova will be responsible for free maintenance.
2. Within the warranty period, maintenance will be charged for the damages caused by the following reasons:
   - Improper use or repair/modification without prior permission
   - Fire, flood, abnormal voltage, other disasters and secondary disaster
   - Hardware damage caused by dropping or transportation after procurement
   - Improper operation
   - Trouble out of the equipment (for example, external device)
3. If there is any failure or damage to the product, please correctly fill out the Product Warranty Card in detail.
4. The maintenance fee is charged according to the latest Maintenance Price List of Monarch.
5. The Product Warranty Card is not re-issued. Please keep the card and present it to the maintenance personnel when asking for maintenance.
6. If there is any problem during the service, contact us or our agent directly.
7. This agreement shall be interpreted by Suzhou MONARCH Control Technology Co., Ltd.

Suzhou MONARCH Control Technology Co., Ltd.

Address: No.16, Youxiang Road, Yuexi Town, Wuzhong District, Suzhou, P.R.China

P.C.: 215104

Website: http://www.szmctc.cn

Product Warranty Card

<table>
<tr><td rowspan="3">Customer information</td><td colspan="2">Company address:</td></tr>
<tr><td rowspan="2">Company name:

P.C.:</td><td>Contact person:</td></tr>
<tr><td>Tel or Email.:</td></tr>
<tr><td rowspan="3">Product information</td><td colspan="2">Product model:</td></tr>
<tr><td colspan="2">Product barcode (Attach here):</td></tr>
<tr><td colspan="2">Name of supplier:</td></tr>
<tr><td>Failure information</td><td colspan="2">(Maintenance time and content):

Maintenance personnel:</td></tr>
</table>

Monarch

NICE3000^{new}

Integrated Elevator Controller

Monarch

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