Monarch

User Guide

NICE 100+ Open-Loop Integrated Elevator Controller

User Guide

INOVANCE

A02
Data code 19010615

Preface

Thank you for purchasing the NICE100+ series open-loop integrated elevator controller.

The NICE100+ is a new-generation integrated elevator controller independently developed and manufactured by Inovance based on a large number of applications and new industrial features. It has the following advantages: a) Using high-performance vector control technology, it supports both sensorless vector control and voltage/frequency (V/F) control; b) It drives an AC asynchronous motor without the need of an encoder; c) It supports Modbus communication protocols for remote monitoring. The NICE100+ serves a maximum of 12 floors and is widely used in household, villa and freight elevators.

This guide provides guidance on correct use of the NICE100+, including information on product features, safety precautions, installation, operation, maintenance, and troubleshooting. Read and understand the guide before using the product, and keep it carefully for future operation and maintenance.

The personnel who involve in system installation, commissioning and maintenance must receive necessary trainings on safety and use of the product, understand this guide thoroughly, and have related experience before performing commissioning and maintenance tasks.

Note
◆ For illustration purpose, the drawings in the guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified before using the product, and operate in accordance with the instructions. ◆ The drawings in the guide are for illustration only. Actual products may vary. ◆ 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 guide. ◆ Contact the customer service center of Inovance if you have problems during use.

■ Upon unpacking, check:

1) Whether the model number and controller ratings are consistent with your order. The packaging box contains the controller, certificate of conformity, and user guide.

2) Whether the controller is damaged during transportation. If you find any omission or damage, contact your supplier or Inovance immediately.

■ For first-time use:

For users who use this product for the first time, read this guide carefully. If you have any problem concerning the functions or performance, contact the technical support personnel of Inovance to ensure correct use.

■ CE Marks

CE marks on the NICE100+ controller indicate that this product complies with EU's Low Voltage Directive (LVD) and electromagnetic compatibility (EMC) Directive and is CE certified.

The NICE100+ complies with the following directives and standards.

Directive	Directive Name	Standard Compliance
EMC	2014/30/EU	EN 12015:2014 EN 12016:2013
LVD	2014/35/EU	EN61800-5-1

NOTE

◆ Install and use the controller in compliance with the instructions in *"Appendix A Electromagnetic Compatibility" on page 128* to fulfill EMC requirements.

Contents

Introduction

Basic Functions

Function	Description	Remarks
General Functions		
Integrated open-loop control for asynchronous motors	The controller can drive an AC asynchronous motor without the need for an encoder.	-
Full collective selective	In the automatic running or attendant state, this function enables the elevator to respond to 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.	Set collective selective in FE-00
Door open time setting	The system automatically determines different open time for door open upon calls/commands, door open protection, or delayed door open according to the preset door open holding time.	Set in group FB
Door open holding	In the automatic running state, passengers can press the door open button in the car to delay door close to facilitate goods to be moved in or out.	Set in group FB
Door operator service floor setting	You can set the required service floors of door operators.	Set in FB-02 and FB-04
Advance door closing (ADC) 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.	-
Door feature selection	The controller enables the setting of features based on different types of door systems, including power operated doors, manual doors, and semi-automatic doors.	Set in FB-18
Floor number display setting	The system supports floor display combining 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 feature is invalid in fire emergency state.	-
Repeated 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 repeatedly.	Set the door close protection time in FB-08
Auto-leveling	The system implements automatic accurate leveling based on the floor pulse counting and up/down leveling feedback signals.	-

Function	Description	Remarks
Response at acceleration	The system allows the elevator to automatically respond to calls from the service floors during acceleration.	-
Idle elevator returning to main floor	In the 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.	Set idle time before returning to main floor in F9-00
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.	-
Service floor setting	You can enable or disable the system service for certain floors flexibly based on actual requirements.	Set in F6-05
Attendant running	In the attendant state, the elevator running is controlled by the attendant.	-
Low-speed self-rescue	When the elevator is in non-inspection state and stops in a 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 features	You can set whether the system keeps outputting door open/close command after door open/close limit based on the type of the door operator.	-
Car arrival gong	After the elevator arrives at the destination floor, the main control board (MCB) gives a prompt tone.	
Direct travel ride	The system automatically calculates and generates the running curves based on the distance, enabling the elevator to directly stop at the leveling position without creeping.	-
Automatic generation of the optimum curve	The system automatically calculates the optimum speed curve compliant with the human-machine interaction principle based on the distance, without being limited by the number of curves or short floor.	-
Out-of-service output	When the elevator cannot respond to hall calls, the corresponding terminal outputs an out-of-service signal.	-
Number of running cycles	In the automatic running state, the system automatically records the number of running cycles of the elevator.	Recorded in F9-05 and F9-06

Function	Description	Remarks
Running time recording	The system automatically records the accumulative power-on time, working hours, and working days of the elevator.	Recorded in F9-03
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.	Set door open/ close protection times in FB-09
Direct travel ride with full-load	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 a single elevator) or by another elevator (in the case of parallel 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 on faults, which improves the efficiency of maintenance and repair.	Set in group FC/ parameters E0 to E9
Inspection-related Functions		
Shaft auto-tuning	The controller supports four shaft types. For shaft type 1, 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. Shaft type 0, 2, and 3 do not require shaft auto-tuning. For these shaft types, the elevator can run after related parameters are set.	-
User-defined parameter checking	You can view the parameters that are modified and different from the default setting.	Set in FP-02
Inspection running	After entering the inspection running state, the system cancels automatic running and related operations. You can press the up or down call button to make the elevator jog at the inspection speed.	-
Motor auto-tuning	With a simple parameter setting, the system can obtain the control parameters of the motor using the auto-tuning function, which can be selected between static auto-tuning 1 and static auto-tuning 2.	-

Function	Description	Remarks
Floor position intelligent correction	Every time the elevator runs to the terminal floor, the system automatically checks and corrects the car position information based on slow-down switches, and eliminates over travel top/bottom terminal with the use of slow-down switches.	-
Dual-speed for inspection	Considering inaccurate running control at high inspection speed but long running time at low inspection speed, the system provides the dual-speed curve for inspection, which greatly improves the efficiency at inspection.	-
Test running	The test running includes the fatigue test of a new elevator, inhibiting hall call response, inhibiting door open/close, disabling terminal floor limit switch, disabling overload signal, and so on.	Set in F6-10
Fire Emergency and Safety Functions		
Returning to main 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.	Set fire emergency floor in F6-03
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.	Set firefighter running function in F6-68
Elevator lock	In the automatic running state, when the elevator lock switch acts, the elevator cancels all registered calls, returns to the elevator lock floor, stops running, and turns off the lighting and fan in the car.	Set elevator lock floor in F6-04
Troubleshooting based on fault level	Faults are classified into different levels based on the severity. Different levels of faults are rectified using different methods.	-
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 (Y0) for emergency evacuation automatic switchover to implement emergency evacuation at power failure.	Y0 is the dedicated output for emergency evacuation switchover
Running direction identification at power failure	When the power supply is interrupted, the system can automatically identify the current car load and determine the running direction.	Set emergency evacuation function in F6-69

Function	Description	Remarks
Main floor verification	After detecting a position abnormality, the system runs the elevator to each floor till the terminal floor for verification, ensuring the safety and reliability of the system.	-
Passenger unloading first upon the fault	The system automatically determines the fault level. If the safety running conditions are met, the elevator first runs to the leveling position to unload passengers.	-
Interference degree judgment	The system judges the degree of communication interference.	View 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 permanent magnet synchronous motor (PMSM), after the elevator decelerates to stop, the holding current of the motor is canceled in ramp mode, preventing abnormal noise during current cancellation.	-
Independent working power supply	The controller supports not only three-phase 380 VAC but also single-phase 220 VAC to meet different applications of the power supply system, such as a 220 V uninterruptible power supply (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 the power supply, such as emergency UPS.	-
Additional Functions		
Anti-nuisance function	The system automatically compares the number of passengers in the car 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.	Select anti-nuisance method in F8-13
Prompt of stop in non-door zone	The system gives a prompt when the elevator stops in a non-door zone area due to faults.	-
Interface for intelligent residential management	The system provides an interface for intelligent residential management to perform remote monitoring of elevators in the residential district.	Residential monitoring board (MCTC-MIB) required

Function	Description	Remarks
Parameter copy	You can upload and download parameters using the operating panel MDKE6.	Operating panel MDKE6 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 lighting and fan in the car.	Set energy-saving time in F9-01
Energy-saving of the idle door operator	After the car lighting is turned off, the system does not output the door close command, which reduces the power consumption of the door operator.	Set in FE-14

Optional Functions

Function	Description	Configuration
Emergency evacuation at power failure	For the elevator configured with a UPS, the system uses the UPS to implement low-speed self-rescue in the case of power failure.	UPS required
On-site commissioning	The system can control and monitor the running of elevators using the NEMS commissioning software.	NEMS software required
Commissioning by mobile phone	Smartphones can be connected to the controller through the external WIFI module, and you can commission and monitor the elevator, and upload and download parameters by using the phones.	
Residential monitoring	The control system can be connected to the terminal in the monitoring room. Using the NEMS software, you can view the floor position, running direction, and fault state of the elevator.	NEMS software and Residential monitoring board (MCTC-MIB required

Safety Instructions

Safety Precautions

1) Before installing, using, and maintaining this equipment, read the safety information and precautions thoroughly, and comply with them during operations.
2) To ensure the safety of humans and equipment, follow the signs on the equipment and all the safety instructions in this user guide.
3) "CAUTION", "WARNING", and "DANGER" items in the manual do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
4) Use this equipment according to the designated environment requirements. Damage caused by improper usage is not covered by warranty.
5) Inovance shall take no responsibility for any personal injuries or property damage caused by improper usage.

Safety Levels and Definitions

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

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

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

Safety Instructions

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

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

Storage and Transportation

- Store and transport this equipment based on the storage and transportation requirements for humidity and temperature.
- Avoid transporting the equipment in environments such as water splashing, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Avoid storing this equipment for more than three months. Long-term storage requires stricter protection and necessary inspections.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport this equipment with other equipment or materials that may harm or have negative impacts on this equipment.

- Use professional loading and unloading equipment to carry large-scale or heavy equipment.
- When carrying this equipment with bare hands, hold the equipment casing firmly with care to prevent parts falling. Failure to comply may result in personal injuries.
- Handle the equipment with care during transportation and mind your step to prevent personal injuries or equipment damage.
- Never stand or stay below the equipment when the equipment is lifted by hoisting equipment.

Installation

- Thoroughly read the safety instructions and the user guide before installation.
- Do not modify this equipment.
- Do not rotate the equipment components or loosen fixed bolts (especially those marked in red) on equipment components.
- Do not install this equipment in places with strong electric or magnetic fields.
- When this equipment is installed in a cabinet or final equipment, protection measures such as a fireproof enclosure, electrical enclosure, or mechanical enclosure must be provided. The IP rating must meet IEC standards and local laws and regulations.

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed by only professionals.
- Installation, wiring, maintenance, inspection, or parts replacement must be performed by only experienced personnel who have been trained with necessary electrical information.
- Installation personnel must be familiar with equipment installation requirements and relevant technical materials.
- Before installing equipment with strong electromagnetic interference, such as a transformer, install an electromagnetic shielding device for this equipment to prevent malfunctions.

Wiring

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed by only professionals.
- Never perform wiring at power-on. Failure to comply will result in an electric shock.
- Before wiring, cut off all equipment power supplies. Wait at least 10 minutes before further operations because residual voltage exists after power-off.
- Make sure that the equipment is well grounded. Failure to comply will result in an electric shock.
- During wiring, follow the proper electrostatic discharge (ESD) procedures, and wear an antistatic wrist strap. Failure to comply will result in damage to internal equipment circuits.

- Never connect the power cable to output terminals of the equipment. Failure to comply may cause equipment damage or even a fire.
- When connecting a drive with the motor, make sure that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation.
- Wiring cables must meet diameter and shielding requirements. The shielding layer of shielded cables must be reliably grounded at one end.
- After wiring, make sure that no screws are fallen and cables are exposed in the equipment.

Power-on

- Before power-on, make sure that the equipment is installed properly with reliable wiring and the motor can be restarted.
- Before power-on, make sure that the power supply meets equipment requirements to prevent equipment damage or even a fire.
- At power-on, unexpected operations may be triggered on the equipment. Therefore, stay away from the equipment.
- After power-on, do not open the cabinet door and protective cover of the equipment. Failure to comply will result in an electric shock.
- Do not touch any wiring terminals at power-on. Failure to comply will result in an electric shock.
- Do not remove any part of the equipment at power-on. Failure to comply will result in an electric shock.

Operation

- Do not touch any wiring terminals during operation. Failure to comply will result in an electric shock.
- Do not remove any part of the equipment during operation. Failure to comply will result in an electric shock.
- Do not touch the equipment shell, fan, or resistor for temperature detection. Failure to comply will result in heat injuries.
- Signal detection must be performed by only professionals during operation. Failure to comply will result in personal injuries or equipment damage.

- Prevent metal or other objects from falling into the device during operation. Failure to comply may result in equipment damage.
- Do not start or stop the equipment using the contactor. Failure to comply may result in equipment damage.

Maintenance
 ◆ Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed by only professionals. ◆ Do not maintain the equipment at power-on. Failure to comply will result in an electric shock. ◆ Before maintenance, cut off all equipment power supplies and wait for at least 10 minutes.
 ◆ Perform daily and periodic inspection and maintenance for the equipment according to maintenance requirements and keep a maintenance record.
Repair
 ◆ Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed by only professionals. ◆ Do not repair the equipment at power-on. Failure to comply will result in an electric shock. ◆ Before inspection and repair, cut off all equipment power supplies and wait at least 10 minutes.
 ◆ Require for repair services according to the product warranty agreement. ◆ When the equipment is faulty or damaged, require professionals to perform troubleshooting and repair by following repair instructions and keep a repair record. ◆ Replace quick-wear parts of the equipment according to the replacement guide. ◆ Do not operate damaged equipment. Failure to comply may result in worse damage. ◆ After the equipment is replaced, perform wiring inspection and parameter settings again.
Disposal
 ◆ Dispose of retired equipment by following local regulations or standards. Failure to comply may result in property damage, personal injuries, or even death. ◆ Recycle retired equipment by following industry waste disposal standards to avoid environmental pollution.

General Precautions

■ Requirements on residual current device (RCD)

The controller generates high leakage current during running, which flows through the

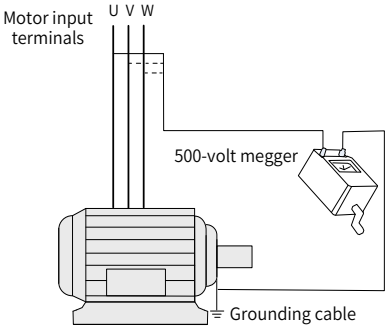
protective grounding conductor. Install a type-B RCD at the primary side of the power supply. When selecting the RCD, you should consider the transient and steady-state leakage current to ground that may be generated at startup and during running of the controller. You can select a specialized RCD with the function of suppressing high harmonics or a general-purpose RCD with a relatively large residual current.

■ High leakage current warning

The controller generates high leakage current during running, which flows through the protective grounding conductor. Ground the controller before connecting it to the power supply. Grounding must comply with local regulations and related IEC standards.

■ Motor insulation test

Perform the insulation test when the motor is used for the first time, when it is reused after being stored for a long time, or in a regular check-up, to prevent the poor insulation of motor windings from damaging the controller. The motor must be disconnected from the controller during the insulation test. A 500-volt megger is recommended for the test. Ensure that the insulation resistance is not less than 5 MΩ.



■ Thermal protection of motor

If the rated capacity of the selected motor 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 operating panel of the controller or install a thermal relay for the motor circuit for protection.

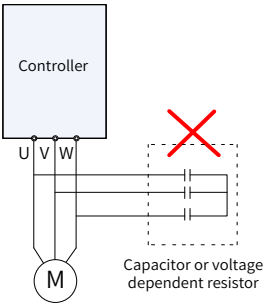
■ Motor heating and noise

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

■ Voltage dependent resistor (VDR) or capacitor for improving power factor on the output side

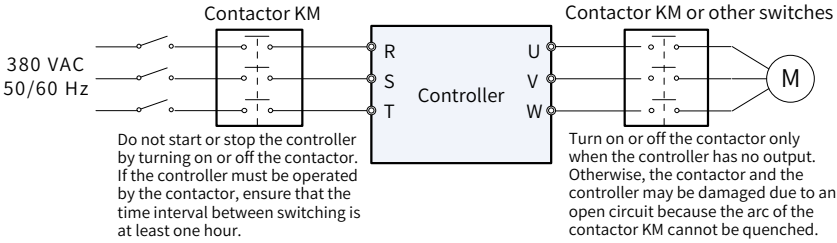
The controller outputs PWM waves. Do not install the capacitor for improving power factor or lightning protection voltage dependent resistor (VDR) on the output side of

the controller. Otherwise, transient overcurrent or even damage to the controller may occur.



■ Contactors on the input and output sides of the controller

When a contactor is installed between the input side of the controller and the power supply, do not start or stop the controller by turning on or off the contactor. When a contactor is installed between the output side of the controller and the motor, do not turn on or off the contactor when the controller has an output. Otherwise, modules inside the controller may be damaged.



■ Use outside the rated voltage

The controller must be used within the allowable voltage range specified in this guide. Otherwise, components inside the controller may be damaged. If required, use a corresponding voltage step-up or step-down device.

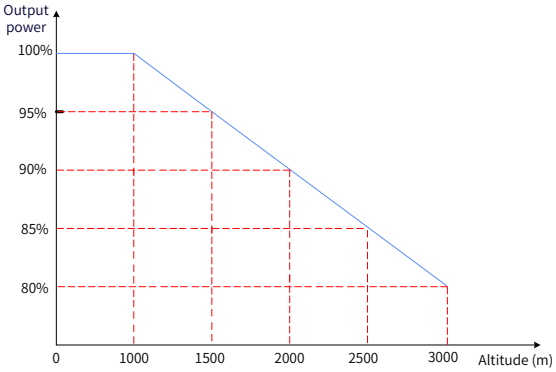
■ Surge protection device (SPD)

The controller has a built-in VDR for suppressing the surge voltage generated when the inductive loads around the AC drive are switched on or off. If the inductive loads generate very high surge voltage, use an SPD for the inductive load or use an SPD together with a diode.

Note: Do not connect the SPD to the output side of the AC drive.

■ 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. The detailed de-rating data is shown in the following figure.



■ Ambient temperature and de-rating

The controller is designed to operate under an ambient temperature between -10°C and +50°C. When the ambient temperature is above 40°C, the controller must be derated by 1.5% for each 1°C higher. The maximum operating temperature is 50°C.

■ 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.

■ Compatible motor

The controller can work with squirrel-cage asynchronous motor and PMSM. Select a proper controller according to the motor nameplate.

The default parameters configured inside the controller are squirrel-cage asynchronous motor parameters. It is still necessary to perform motor auto-tuning or modify the default values based on actual conditions. Otherwise, the running effect and protection performance will be affected.

■ Precautions on selecting residual current device (RCD)

Tripping may be caused if an improper RCD is selected when the controller drives the motor. This is because the output wave of the controller has high harmonics and the motor cable and the cable connecting the controller and the motor produce leakage current, which is much larger than the current when the motor runs at the mains frequency. Thus, it is necessary to determine the proper RCD sensitivity based on the general leakage current of the cables and the motor. The leakage current is dependent

on the motor capacity, cable length, insulation class, and wiring method. Generally, the leakage current on the output side of the controller is three times of the current when the motor runs at the mains frequency.

Protective Features

Adopting different protective functions for different levels of faults, NICE100+ provides the elevator running system with full abnormality protection.

The controller provides protective functions against the following abnormalities:

■ Speed abnormal

The controller monitors the encoder feedback speed and output torque. Once the feedback speed exceeds the limit or the deviation between the torque limit and the speed feedback is too large, the controller performs protection immediately, reports an alarm and prohibits running.

■ Drive control abnormal

The related faults include drive overcurrent, overvoltage/undervoltage, power input/output phase loss, overload, and storage abnormality. If such a fault occurs, the controller performs protection immediately, stops output, applies the brake and prohibits running.

■ Leveling sensor abnormal

The related faults include sensor failure or sensor stuck. The controller judges whether a fault occurs based on the leveling signal change. If the leveling signal does not change within the set time, the system reports an alarm.

■ Floor data abnormal

The system stores the floor information through shaft auto-tuning (for shaft type 1 only) or directly sets the floor pulse information (for shaft types 0, 2, and 3). If the floor data is abnormal, the system prompts the fault information during first running. During actual running, the controller continuously compares position information input by digital inputs (DIs) with the stored floor data. If the deviation is large, the system reports an alarm.

1 Product Information

1.1 Model Number and Nameplate

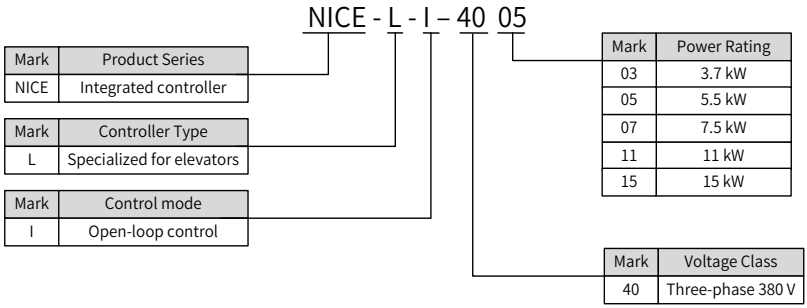


Figure 1-1 Model number

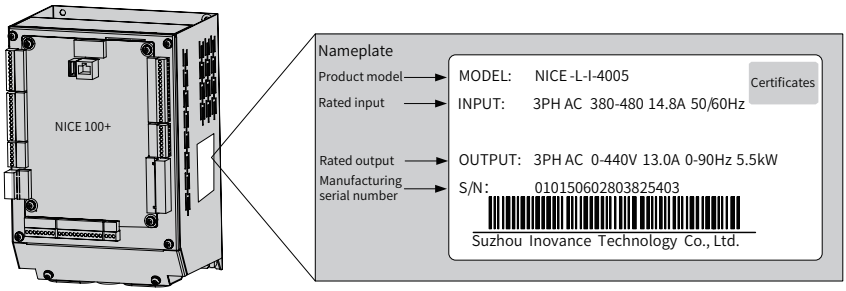


Figure 1-2 Nameplate

1.2 Technical Data

Table 1-1 Technical data

Controller Model	Power Capacity (kVA)	Input Current (A)	Output Current (A)	Compatible Motor Power (kW)
Three-phase 380 V, range: -15% to 15%				
NICE-L-I-4003	5.9	10.5	9.0	3.75
NICE-L-I-4005	8.9	14.8	13.0	5.5
NICE-L-I-4007	11.0	20.5	18.0	7.5
NICE-L-I-4011	17.0	29.0	27.0	11.0
NICE-L-I-4015	21.0	36.0	33.0	15.0

1.3 Technical Specifications

Table 1-2 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)/V/F control	
	Startup torque	0.5 Hz: 180% (SVC)	
	Speed adjustment range	1:100 (SVC)	1:50 (V/F control)
	Speed stability accuracy	±0.5% (SVC)	±0.5% (feedback vector control, FVC)
	Torque control accuracy	±5% (FVC)	
	Overload	60s for 150% of the rated current; 1s for 200% of the rated current	
	Motor auto-tuning	Static auto-tuning for asynchronous motor	
	Distance control	Direct travel ride mode in which the leveling position can be adjusted flexibly	
	Acceleration/ Deceleration curve	Automatic generation of multiple curves	
	Slow-down	New reliable slow-down function, automatically identifying the position of the slow-down bracket	
	Shaft auto-tuning	32-bit data, accurately recording the positions in the shaft	
	Leveling adjustment	Flexible and easy-to-use leveling adjustment function	
	Test function	Easy to implement multiple elevator commissioning functions	
	Fault protection	Solutions to different levels of elevator faults	
	Intelligent management	Implementing remote monitoring, user management and elevator dispatch under parallel control	
	Safety check of peripheral devices after power-on	Safety check of peripheral devices, such as grounding and short circuit, after power-on	
	Status monitoring	Monitoring the state of feedback signals to ensure that the elevator works properly	

Item		Specification
I/O features	Digital input (DI)	24 x DI terminals: 24 V, 5 mA
		3 higher-voltage detection input terminals of safety circuit and door lock circuit Input: 95–125 V
	Communication port	One CANbus communication port and one Modbus communication port
	Output terminal block	25 relay output terminals The terminals can be allocated with different functions.
Operation and display	Operating panel	5-digit LED display, viewing/modifying most parameters and monitoring the system state
	NEMS software	Connecting the control system and the host computer, convenient for viewing/motoring the system state
Environment	Altitude	Below 1000 m (de-rated 1% for each 100 m higher)
	Ambient temperature	–10°C to +50°C (de-rated if the ambient temperature is above 40°C)
	Humidity	Maximum relative humidity: 95%RH, non-condensing
	Vibration	Maximum vibration: 5.9 m/s^2 (0.6 g)
	Storage temperature	-20°C to +60°C
	Pollution degree	PD2
	IP rating	IP20
	Applied power distribution system	TN/TT

1.4 Connection of Peripheral Devices

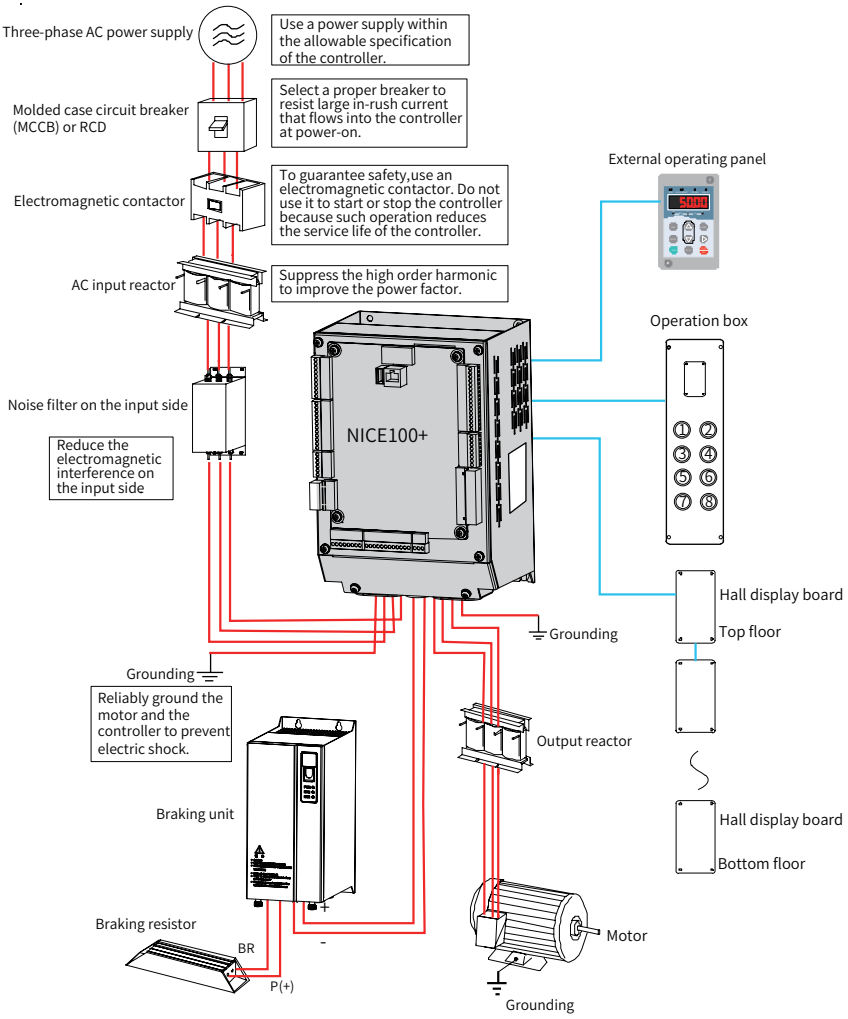


Figure 1-3 Connection between the NICE100+ and peripheral devices

NOTE

- The preceding figure is a schematic diagram showing the connection between the controller and its peripheral devices.
- Some of the peripheral devices are obtainable through Inovance. Contact our commercial staff if you need.
- The controller must be installed inside a power distribution box. Grounding is required for the power distribution box.

1.5 Optional Parts

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

Table 1-3 Optional parts

Description	Model	Function	Remarks
External LED operating panel	MDKE	External LED display and operating panel	RJ45 port
External LED operating panel	MDKE6	External LED display and operating panel	It can be used for copying parameters.
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.

2 Installation and Wiring

2.1 Preparation

2.1.1 Environment Requirements

- Ambient temperature: The ambient temperature substantially impacts the service life of the controller. Do not operate the controller outside the allowable ambient temperature (-10°C to +50°C);
- Install the controller on the surface of an incombustible object, and ensure that there is sufficient space around for heat dissipation;
- Install the controller in a place away from vibration. The vibration cannot exceed 0.6 g;
- Install the controller in a place free from direct sunlight, high humidity, and condensation;
- Install the controller in a place free from corrosive, explosive and combustible gas;
- Install the controller in a place free from oil dirt, dust, and metal powder.

2.1.2 Clearance Requirements

The clearance to be reserved for installing the controller is as follows.

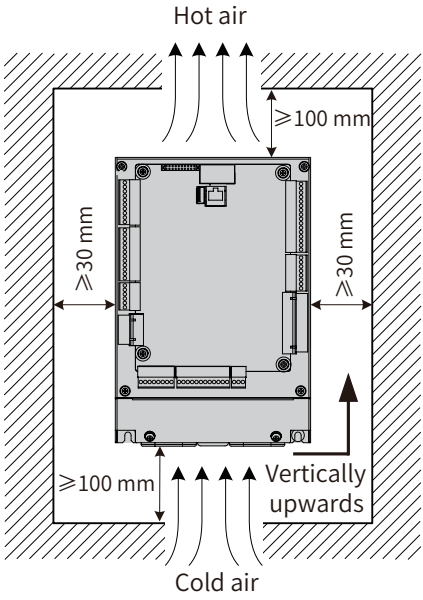


Figure 2-1 Installation clearances

2.2 Product Dimensions

The dimensions of the controller are as follows.

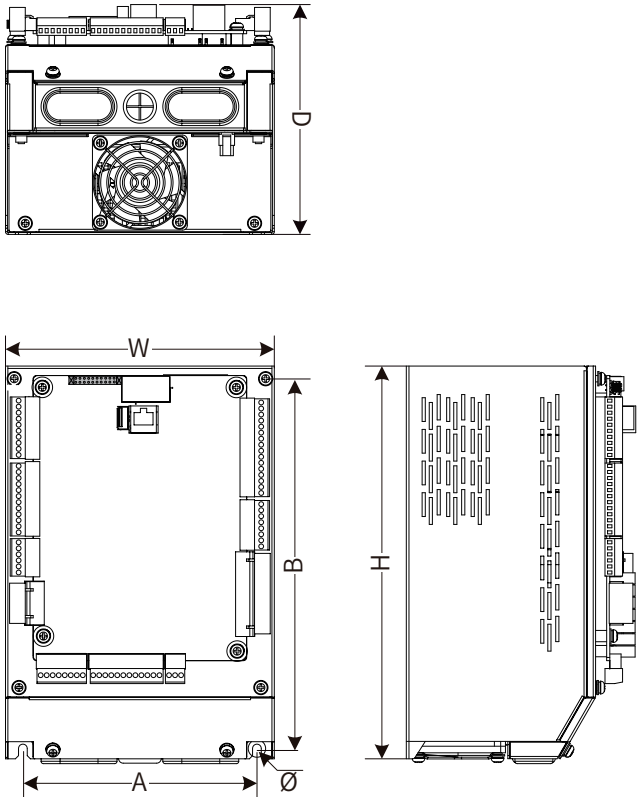


Figure 2-2 Dimensions of the controller

The corresponding data of the controller dimensions are as follows:

Table 2-1 Dimensions of the controller

Controller Model	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Hole Diameter (mm)	Fastening Screw
Three-phase 380 V, range: -15% to 15%							
NICE-L-I-4003	148	235	248	170	145	5.5	M5
NICE-L-I-4005							
NICE-L-I-4007	150	345	359	220	179	7	M6
NICE-L-I-4011							
NICE-L-I-4015							

2.3 Installation Instructions

The NICE100+ is installed vertically upward on the support with screws fixed into the four mounting holes. The following figure shows the fasteners and tightening torque of mounting holes.

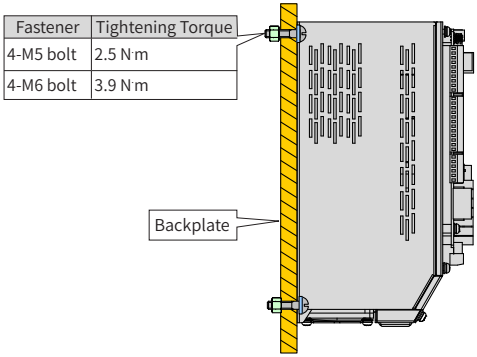


Figure 2-3 Fasteners and tightening torque of mounting holes

The controller is generally installed in the control cabinet of the machine room. Pay attention to the following points when designing the control cabinet:

- The temperature inside the cabinet cannot 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 cannot 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 the 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 machine room. Note that the temperature inside the cabinet cannot be too low; otherwise, condensation may occur, causing a short circuit of components.
- For a special environment where the temperature is high but cannot be reduced effectively, de-rate the controller during use.

2.4 Wiring of Main Control Board Terminals

1) Terminal Arrangement

The following figure shows the terminal arrangement of the controller.

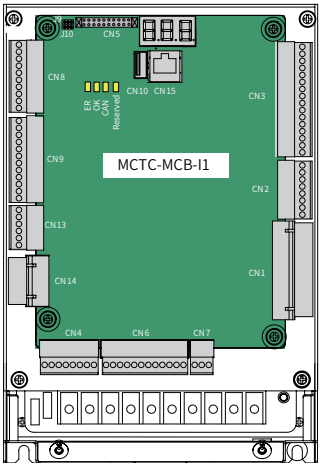


Figure 2-4 Terminal arrangement of the NICE100+

2) Description of Main Circuit Terminals

The following figure shows the arrangement of main circuit terminals.

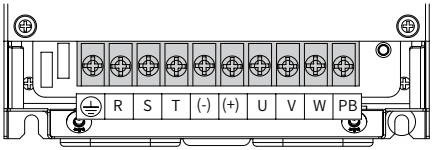


Figure 2-5 Arrangement of main circuit terminals

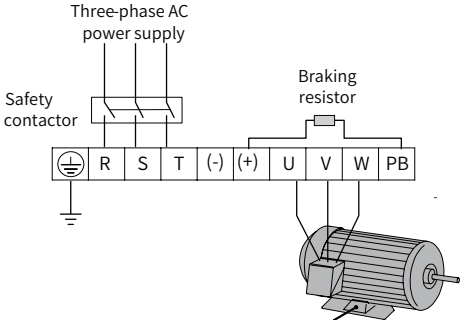


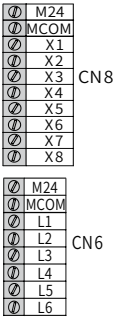
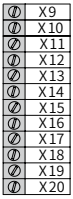
Figure 2-6 Wiring of the main circuit

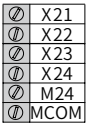
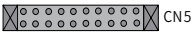
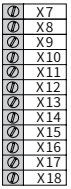
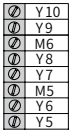
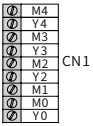
Table 2-2 Description of main circuit terminals

Mark	Name	Description
R, S, T	Three-phase power supply input terminals	Provide a three-phase AC power supply.
+, -	Positive and negative terminals of DC bus	Connect the external braking unit and the energy feedback unit.
PB	Terminals for connecting braking resistor	(+), PB: Connect the braking resistor
U, V, W	Controller output terminals	Connect a three-phase motor
⏚	Grounding terminal	Grounding terminal

3) Description of Control Circuit Terminals

Table 2-3 Description of control circuit terminals

Mark		Terminal Name	Function Description	Terminal Arrangement
CN6/ CN8	M24/ MCOM	External 24 VDC power supply	24 VDC power supply for the entire board	
	X1 to X8	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ optocoupler isolation Input current limit: 5 mA DI terminal functions are set in F5-01(X1 function selection) to F5-24 (X24 function selection).	
	L1 to L6	Button function selection	Button input and button indicator output, 24 V power for button illumination	
CN9	X9 to X20	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ Photocoupler isolation Input current limit: 5 mA DI terminal functions are set in F5-01(X1 function selection) to F5-24 (X24 function selection).	
CN14	X25 to X27/ XCM	Higher-voltage detection terminal	Input voltage range: 110 VAC±15% 110 VDC±20% for the safety circuit and door lock circuit, with functions set in F5-25 (X25 higher-voltage input function selection) to F5-27 (X27 higher-voltage input function selection)	

Mark		Terminal Name	Function Description	Terminal Arrangement
CN13	X21 to X24	DI	Input voltage range: 10–30 VDC Input impedance: 4.7 kΩ Photocoupler isolation Input current limit: 5 mA DI terminal functions are set in F5-01(X1 function selection) to F5-24 (X24 function selection).	
	M24/ MCOM	External 24 VDC power supply	24 VDC power supply for the entire board	
CN5	Interface for extension board MCTC-KZ-D			
CN10	USB port	Communication port	Used to connect the external WIFI module for commissioning via smartphones Used to burn the MCB program Used for residential monitoring	
CN15	RJ45 port	Port for operating panel	Used to connect the operating panel	
CN7	L7 to L18	Button function selection	Button input and button indicator output, 24 V power for button illumination	
CN3	Y11 to Y24	Digital output (DO)	Normally-open (NO) output, with a maximum current and voltage of 5 A, 250 VAC; Functions set in F7-11 (Y3 function selection) to F7-24	
CN2	Y5 to Y10	DO	NO output, with maximum current and voltage of 5 A, 250 VAC; Functions set in F7-05 (Y3 function selection) to F7-10	
CN1	Y0 to Y4	DO	NO output, with maximum current and voltage of 5 A, 250 VAC; Functions set in F7-00 (Y3 function selection) to F7-04	

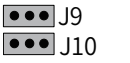
Mark		Terminal Name	Function Description	Terminal Arrangement
CN4	485+/-	485 port	Used for 485 communication	
J9/ J10	Factory reserved. Do not short them randomly. Otherwise, the controller may not work properly.			

Table 2-4 Description of indicators

Mark	Terminal Name	Function Description
ER	Fault indicator	This indicator is ON (red) when a fault occurs on the controller.
OK	Normal running indicator	This indicator is ON (green) when the controller is in normal running state.
CAN	Parallel control communication indicator	This indicator is steady ON (green) when the communication for parallel control is enabled and blinks when the running in parallel mode is normal.
L1 to L18	Button input indicator	This indicator is ON (green) when the button input is active.
X1 to X24	DI signal indicator	This indicator is ON (green) when the external input is active.
Y0 to Y24	DO signal indicator	This indicator is ON (green) when the system output is active.

2.5 Installation of Shaft Position Switches

In elevator control, shaft position switches are needed for car position identification to implement accurate landing and safe running. The shaft position switch signals include the leveling switch signals, up/down slow-down switch signals, up/down limit switch signals, and up/down final limit switch signals. These shaft position signals are directly transmitted to the MCB of the controller through shaft cables. For the wiring method, see *"Figure 2-10 Wiring diagram of the integrated elevator control system" on page 38*.

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

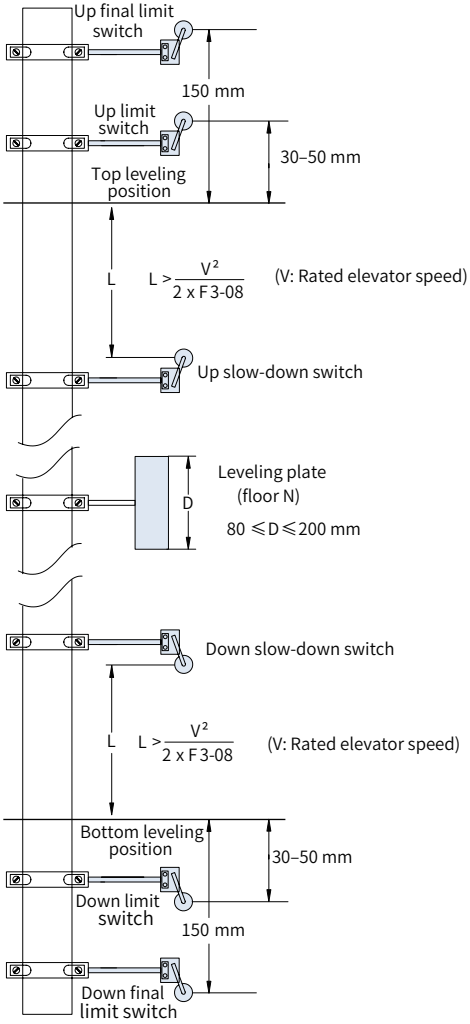


Figure 2-7 Arrangement of shaft position switches

2.5.1 Installation of Leveling Switches

Leveling signals are detected by the leveling switches and leveling plates and directly connected to the input terminals 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. By default, one leveling switch is used in the NICE100+ control system. The leveling plates are installed on the guide rail in the shaft. A leveling plate needs to be installed at each floor. Ensure that leveling plates at all floors are mounted with the same depth and verticality.

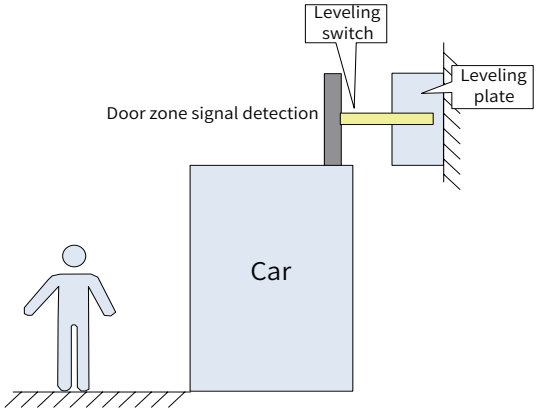
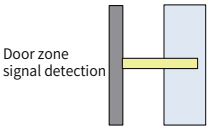
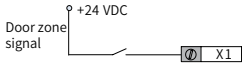
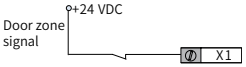


Figure 2-8 Installation position of leveling switches

Number of Leveling Switch	Installation Method	Connecting to Input Terminals of Controller	Parameter Setting
1			F5-01 = 03 (normally open, NO)
			F5-01 = 103 (normally closed, NC)

2.5.2 Installation of Deceleration Switches

Deceleration signals are detected by the deceleration sensors and deceleration plates and directly connected to the input terminals of the controller. It is used to enable the car to land at each floor efficiently and accurately.

The deceleration switches are generally installed on the top of the car. By default, one deceleration sensor is used in the NICE100+ control system, which can be either monostable or bistable. Two deceleration switches are also supported (different sensors for up and down deceleration). The deceleration plates are installed on the guide rail in the shaft. Two deceleration plates (or magnets) need to be installed at each floor. Ensure that deceleration plates at all floors are mounted with the same depth and verticality.

For the open-loop controller (without encoders), deceleration switch signals play an important role in driving the car to land at each floor efficiently and accurately. Installing deceleration switches in correct locations improves the running efficiency of the elevator and prevents the car from mistakenly passing a floor without stop. There are two deceleration plates at each floor: the up deceleration plate and the down deceleration plate. The deceleration distance L1 indicates the distance from the

deceleration plate to the leveling plate at the current floor. The calculating formula is as follows:

$$L_1 > \frac{V_1^2 - V_2^2}{2 \times F3\text{-}05}$$

In the formula, L_1 indicates the deceleration distance, V1 indicates the rated elevator speed (F0-04), V2 indicates the re-leveling speed (F3-10), and F3-05 indicates the deceleration rate.

The default value of F3-05 (Deceleration rate) and F3-10 (Re-leveling speed) are 0.5 m/s^2 and 0.050 m/s^2 respectively. The deceleration distances calculated based on different rated elevator speeds are listed in the following table.

Table 2-5 Deceleration distance based on rated elevator speed

Rated Elevator Speed (m/s)	0.25	0.4	0.5	0.63	0.75	1.0	1.5	1.6	1.75
Deceleration Distance (m)	0.3–0.4	0.5–0.6	0.6–0.8	0.8–1.0	0.9–1.2	1.2–1.5	1.8-2.5		

NOTE

- If the leveling switch at the door zone and the deceleration switch are not at the same level, consider the distance between the leveling switch and the deceleration switch when arranging up and down deceleration plates. The following figure is an example of the deceleration switch position for shaft type 0.
- When installing deceleration plates at the top floor and the bottom floor, install the deceleration plates before slow-down switches as possible as it can so that deceleration switches can act before slow-down switches.

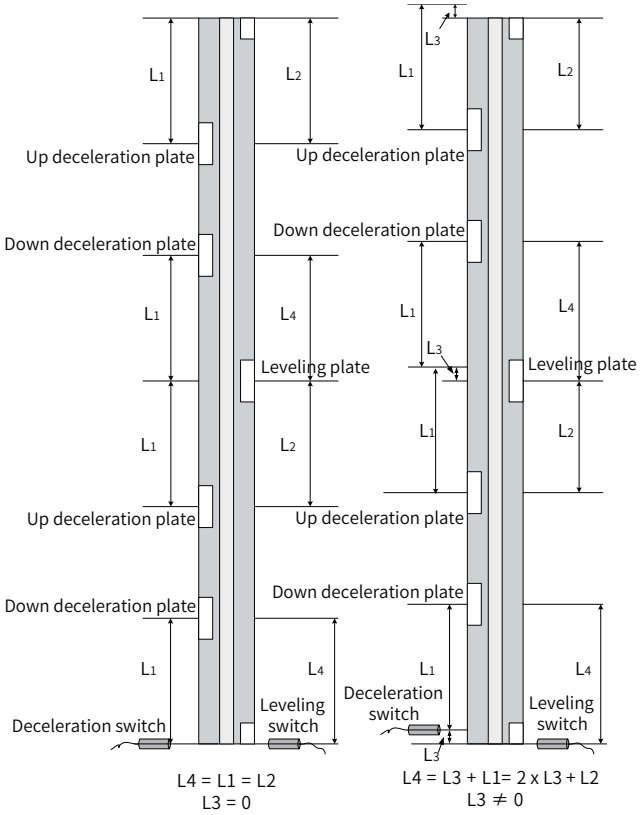


Figure 2-9 Installation position of deceleration switches

2.5.3 Installation of Slow-Down Switches

The slow-down switch is one of the key protective components to prevent the elevator from over travel top terminal or over travel bottom terminal at maximum speed when the elevator position becomes abnormal. The controller supports one pair of slow-down switches. 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 rated elevator speed (F0-04), and F3-08 indicates the special deceleration rate.

The default value of F3-08 (Special deceleration rate) is 0.5 m/s^2. The slow-down distances calculated based on different rated elevator speeds are listed in the following table.

Table 2-6 Terminal slow-down distances

Rated Elevator Speed (m/s)	0.25	0.4	0.5	0.63	0.75	1.0	1.5	1.6	1.75
Slow-down Distance (m)	0.3–0.4	0.5–0.6	0.6–0.8	0.8–1.0	0.9–1.2	1.2–1.5	1.8–2.5		

NOTE

- The slow-down switch supports the terminal floor reset function. It must be installed between the leveling plates of the terminal floor and the secondary terminal floor.

2.5.4 Installation of Limit Switches

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

1) 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 above the top leveling position.

2) 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 below the bottom leveling position.

2.5.5 Installation of Final Limit Switches

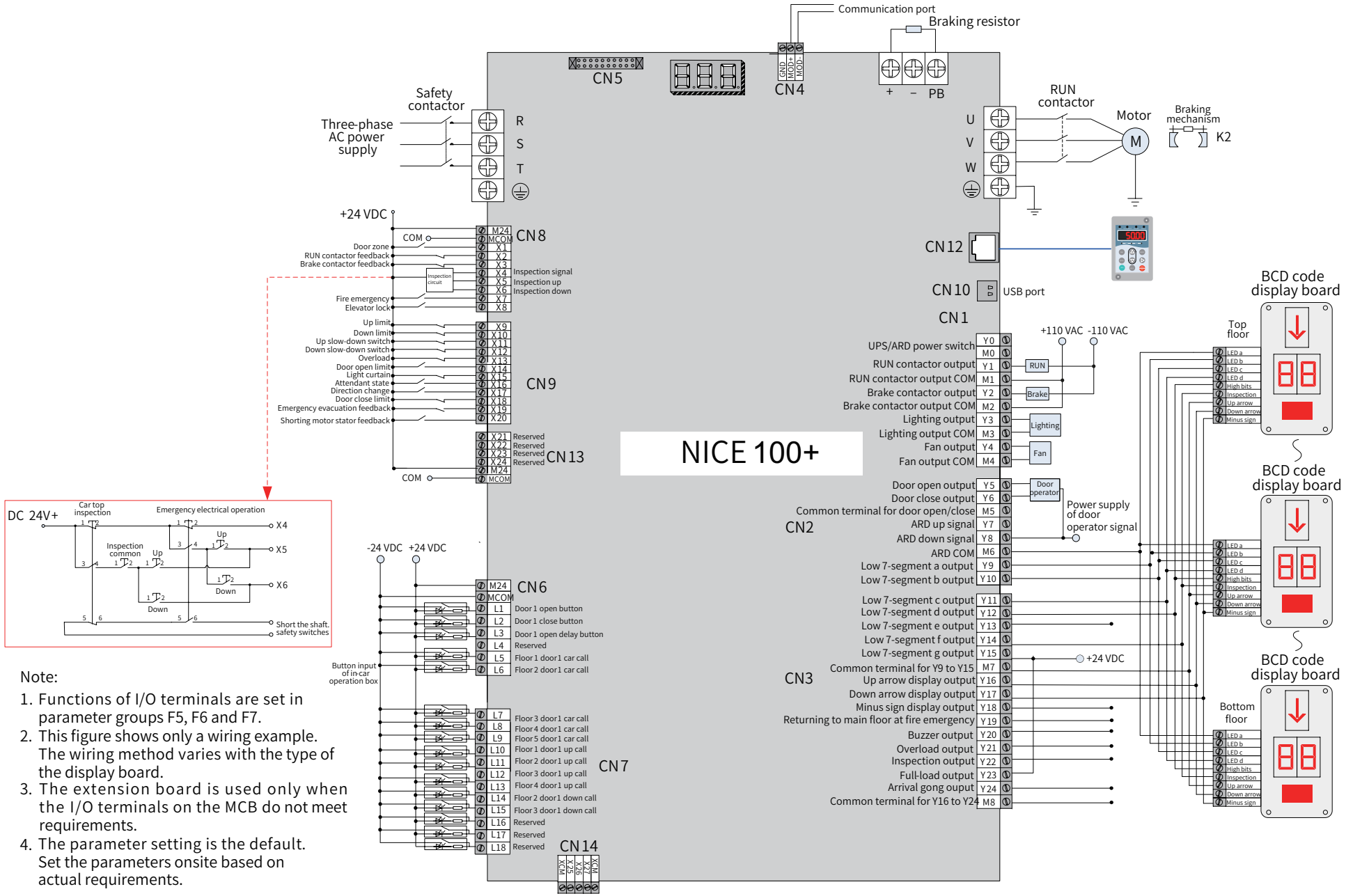
The up/down final limit switch protects the elevator from over travel top/bottom terminal when the elevator does not stop completely upon passing the up/down limit switch.

1) The up final limit switch is mounted above the up limit switch. It is usually 150 mm away from the top leveling position.

2) The down final limit switch is mounted below the down limit switch. It is usually 150 mm away from the bottom leveling position.

2.6 Wiring of the Integrated Elevator Control System

See the following figure for details.



Note:

1. Functions of I/O terminals are set in parameter groups F5, F6 and F7.
2. This figure shows only a wiring example. The wiring method varies with the type of the display board.
3. The extension board is used only when the I/O terminals on the MCB do not meet requirements.
4. The parameter setting is the default. Set the parameters onsite based on actual requirements.

Figure 2-10 Wiring diagram of the integrated elevator control system

3 Panel Operations

The controller supports three commissioning tools: the operation control and information display panel (the operating panel), the host computer monitoring software, and the commissioning app for smartphones.

Tool	Function Description	Remarks
LED operating panel	It is used to view and modify parameters related to elevator drive and control.	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.	Visit the official website of Inovance to download free softwares.
Commissioning app for smart phones (EDSAP)	A WIFI module is used to connect the MCB and the smart phone. You can use the app to commission the elevator, and upload and download parameters.	

3.1 LED Operating Panel

The LED operating panel is connected to the RJ45 port 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 operating panel. The following figure shows the appearance of the operating panel.

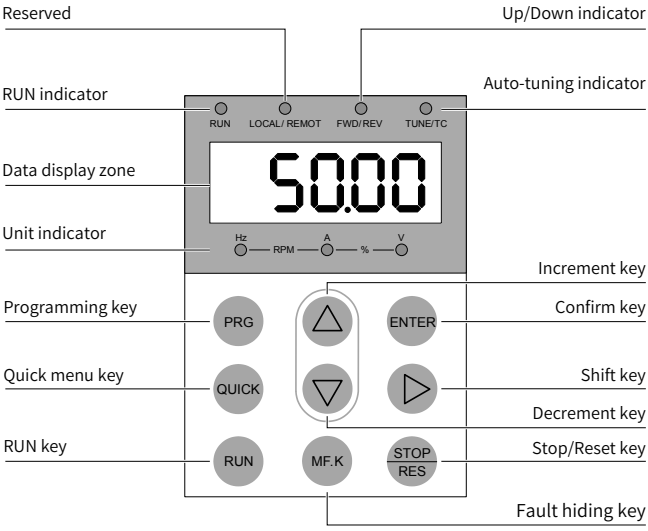


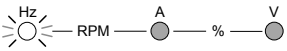
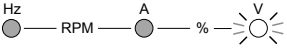
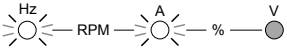
Figure 3-1 Appearance of the operating panel

3.2 Operating Panel Elements

3.2.1 Function Indicators

In the following table,  indicates ON;  indicates OFF, and  indicates blinking.

Table 3-2 Description of indicators

Indicator State		Indication
RUN RUN indicator		OFF: The controller is in stop state.
		ON: The controller is in running state.
LOCAL/REMOT Reserved		Reserved
FWD/REV Elevator running direction indicator		OFF: Elevator running in up direction
		ON: Elevator running in down direction
TUNE/TC Auto-tuning indicator		OFF: not applicable
		ON: Auto-tuning state
		Frequency unit: Hz
		Current unit: A
		Voltage unit: V
		Rotation speed unit: RPM
		Percentage: %

3.2.2 Keys

Table 3-3 Description of keys

Key	Name	Function
PRG	Programming	Enter or exit Level I menu.
ENTER	Confirm	Enter the menu interfaces level by level and confirm parameter settings.
△	Increment	Increase data or parameter number.
▽	Decrement	Decrease data or parameter number.
▷	Shift	Select the displayed parameters in turn in stop or running state, and select the digit to be modified when modifying parameters.
RUN	RUN	Start the controller in the operating panel control mode.
STOP/RES	Stop/Reset	Stop the controller when it is in running state and perform the reset operation when it is in fault state.
QUICK	Quick menu	Enter or exit Level I quick menu.
MF.K	Fault hiding	Display or hide the fault information in fault state, which facilitates parameter viewing.

3.3 Parameter Menu Description

The operating panel adopts a three-level menu to perform operations such as parameter settings. It consists of:

- Level I: parameter group
- Level II: parameter No.
- Level III: parameter value

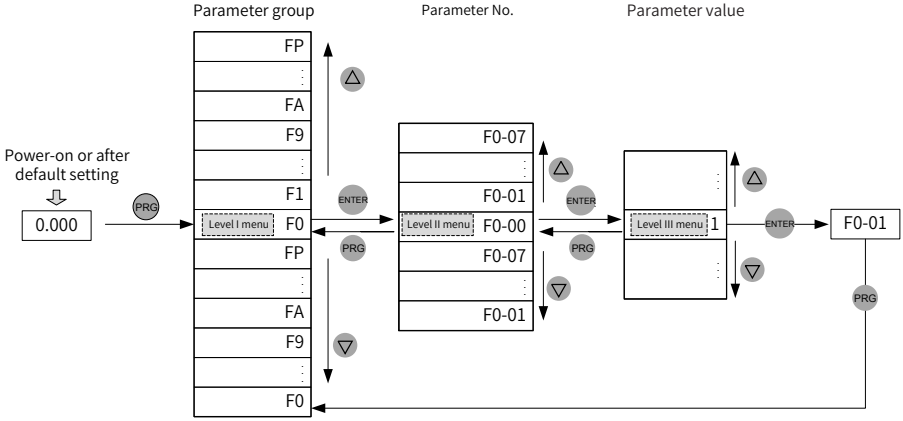


Figure 3-2 Structure of the three-level menu

Pay attention to the following items:

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

- After you press ENTER , the system saves the parameter setting first, and then returns to Level II menu and shifts to the next parameter.
- After you press PRG , the system does not save the parameter setting, but directly returns to Level II menu and remains at the current parameter.

In Level III menu, if the parameter has no blinking digit, it means that the parameter cannot be modified.

This may be because:

- Such a parameter is only readable, such as actually-detected parameters and running record parameters.
- Such a parameter cannot be modified in the running state and can only be changed in stop state.

4 System Commissioning

4.1 Safety Check Before Commissioning

Perform elevator commissioning after installation. Correct commissioning guarantees safe and normal running of the elevator. Before performing electrical commissioning, check whether electrical and mechanical parts are ready for commissioning to ensure safety. At least two workers need to be onsite during commissioning so that the power supply can be cut off immediately when an abnormality occurs.

1. Check mechanical safety.

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

2. Check electrical wiring.

☐√	No.	Item
☐	1	The power supply cables (R, S, T) are wired correctly and securely.
☐	2	The U, V, W cables between the controller and the motor are wired correctly and securely.
☐	3	The controller (control cabinet) and motor are grounded correctly.
☐	4	The safety circuit is conducted, and the emergency stop buttons and switches in the control cabinet and in the machine room can be enabled.
☐	5	The door lock circuit is conducted. Ensure that the door lock circuit is disconnected after the car door or any hall door is opened.

3. Check electrical safety.

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

4.2 Motor Auto-tuning

The controller supports both V/F control and SVC. In SVC mode, auto-tuning is required before startup of the motor in order that accurate motor parameters can be obtained.

Table 4-1 Parameters related to motor auto-tuning

Parameter No.	Parameter Name	Description
F1-01 to F1-05	Rated motor power/voltage/ current/frequency/speed	Model dependent, manual input
F0-01	Command source selection	0: Operating panel control 1: Distance control
F1-11	Motor auto-tuning mode	0: No operation 1: Asynchronous motor static mode 1 2: Asynchronous motor static auto-tuning mode 2

4.2.1 Asynchronous Motor Static Auto-tuning Mode 1

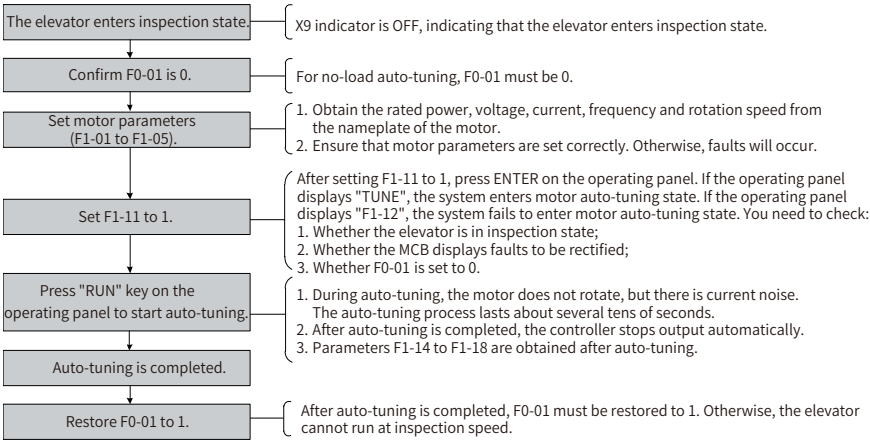


Figure 4-1 Asynchronous motor static auto-tuning mode 1

4.2.2 Asynchronous Motor Static Auto-tuning Mode 2

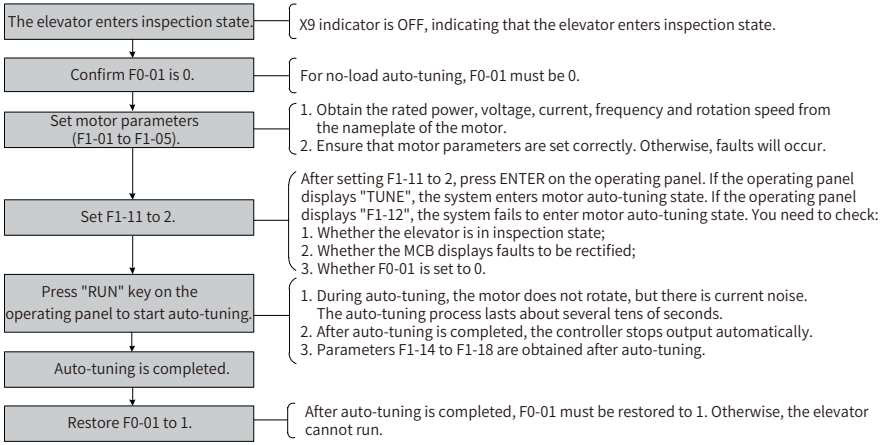


Figure 4-2 Asynchronous motor static auto-tuning mode 2

4.3 Shaft Auto-tuning (Only for Motor Wheel Pulse Type)

1) Make preparations for shaft auto-tuning.

- Confirm that the shaft switches are installed correctly. The signals are valid and reliable.
- Confirm that the pulse signals are stable, the X input electrical level lasts for more than 20 ms (maximum resolution: 50 Hz).
- Confirm that the number of floors is set correctly.

2) Parameters

Parameter No.	Parameter Name	Description	Default	Remarks
F0-04	Rated elevator speed	0.250–1.000 m/s	0.5 m/s	-
F6-00	Top serving floor of the elevator	F6-01 to 12	6	The actual number of floors + 1 – Bottom serving floor
F6-01	Bottom serving floor of the elevator	1 to F6-00	1	-

NOTE

- If the parameter F0-04 (Rated elevator speed) is modified, the elevator must perform another shaft auto-tuning. Otherwise, abnormal conditions may occur during elevator running.
- After F4-00 (Shaft signal type) is modified, the elevator controller must be re-powered on. If F4-00 = 1, perform shaft auto-tuning again, Otherwise, the elevator cannot run normally.

3) Requirements for shaft auto-tuning:

- The elevator is in 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 system 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.

4) Perform shaft auto-tuning.

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

- Set F1-11 (Auto-tuning mode) to 3 on the operating panel.
- After shaft auto-tuning starts, the elevator runs at the inspection speed set in F3-11 (Inspection speed) 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 Err35 is reported during the shaft auto-tuning process, it indicates that shaft auto-tuning fails. You need to rectify the fault according to the solution described in *"6 Troubleshooting" on page 116*, and perform shaft auto-tuning again.

4.4 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 the adjustment of system control and the elevator's mechanical construction.

4.4.1 Adjustment of System Control Performance

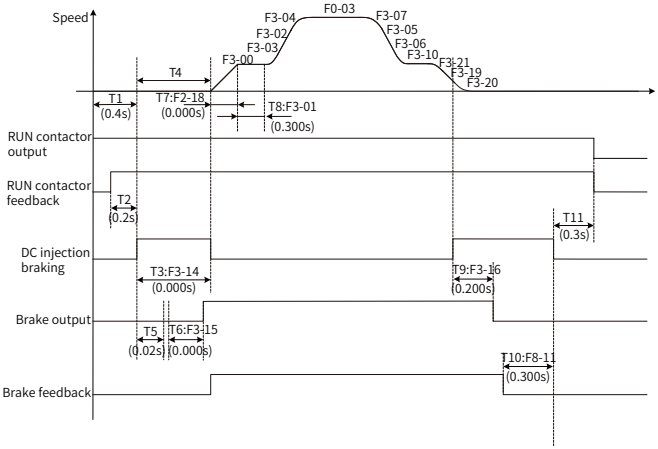


Figure 4-3 Running time sequence of the controller

Parameters related to riding comfort adjustment at elevator startup and stop

Parameter No.	Parameter Name	Setting Range	Default
F2-00	Speed loop proportional gain 1	0–100	10
F2-01	Speed loop integral time 1	0.01–10.00s	0.60s
F2-03	Speed loop proportional gain 2	0–100	35
F2-04	Speed loop integral time 2	0.01–10.00s	0.80s

1 Adjustment to Abnormal Motor Startup

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

- To achieve a faster system response, increase the proportional gain or reduce the integral time. Be aware that either a too big gain or a too short time may lead to system oscillation.
- Decreasing the proportional gain or increasing the integral time will slow the dynamic response of the motor. However, a too small proportional gain or too large integral time may cause motor speed tracking abnormality, resulting in fault Err33 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 an oscillation may occur. To adjust, perform the following.

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

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

2 Adjustment to Elevator Startup

Related parameters:

Parameter No.	Parameter Name	Setting Range	Default
F8-15	DC injection braking current at startup	0–150	0
F3-14	DC injection braking time at startup	0.000–1.000	0.000
F3-15	Brake release delay	0.000–1.000	0.000

4.4.2 Mechanical Factors Affecting Riding Comfort

The mechanical factors affecting the riding comfort involve the installation of the guide rails, guide shoes, steel rope, and brake, the balance of the car, and the resonance caused by the car, guild rails, and motor. For asynchronous motors, abrasion or improper installation of the gearbox may cause poor riding comfort.

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

4.5 Leveling Accuracy Adjustment

1 Leveling Adjustment Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit
Fr-00	Leveling adjustment mode	0–1	0	-
Fr-01	Leveling adjustment record 1	0–15015	0	mm
Fr-02	Leveling adjustment record 2		0	mm
...	...		...	...
Fr-28	Leveling adjustment record 28		0	mm

NOTE

- The parameter value has five digits. The two high bits of each value are used for leveling delay adjustment for up running, and the two low bits are used for leveling delay adjustment for down running. Each parameter is used for the leveling adjustment of a single floor. For example, Fr-02 is used for adjusting the leveling of floor 2. The modification of this parameter does not affect the leveling results of other floors.

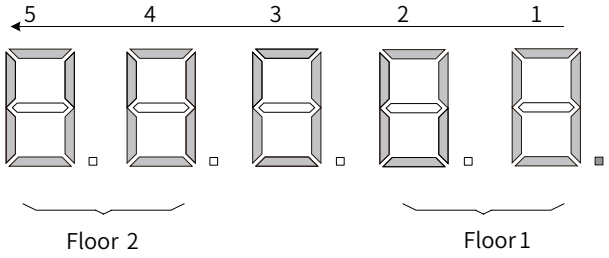
2 Perform the Leveling Adjustment

■ Leveling adjustment in the machine room

Parameters Fr-01 (Leveling adjustment record 1) to Fr-12 (Leveling adjustment record 12) represents floors 1 to 12 in ascending order. That is, Fr-01 represents the bottom floor, Fr-02 represents floor 2, and Fr-12 represents the top floor. For each parameter, Bit1 and Bit2 indicates the leveling stop delay during down running, Bit4 and Bit5 indicates the leveling stop delay during up running. Bit4 and Bit5 are invalid for Fr-01, and Bit1 and Bit2 are invalid for Fr-12.

NOTE

- The leveling stop delay is calculated starting from the time when the elevator receives the leveling signal. When two leveling signals are used, the calculation starts from the time when both leveling signals are received.
- The leveling adjustment must be performed after the riding comfort adjustment is completed.



3 Leveling Adjustment Inside the Car

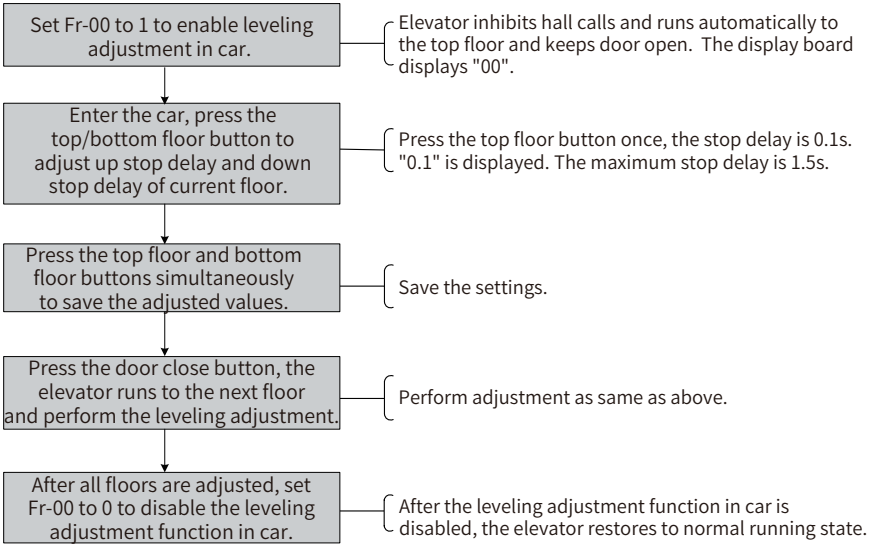


Figure 4-4 Flowchart of leveling adjustment inside the car

NOTE

- Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
- After you set Fr-00 (Leveling adjustment mode) to 1, the elevator does not respond to any hall call, 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. The positive value is "up arrow + value", and the negative value is "down arrow + value", with an adjustment ranging from 0 to 1.5s.
- After you save the values after adjustment, the car display board displays the present floor.
- Note that if a certain floor need not an adjustment, you also need to save the data once. Otherwise, car calls cannot be registered.

5 Parameter Description

5.1 Parameter Description

The parameters adopt a three-level menu.

- Level I: parameter group
- Level II: parameter No.
- Level III: parameter value

The definitions of each column in the parameter table are as follows.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
The number of the parameter	Full name of the parameter	Valid setting range of the parameter value	Factory setting of the parameter	The Measurement unit of the parameter	Whether the parameter can be modified (including the modification conditions)

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

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

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

The system automatically restricts the properties of all parameters to prevent misoperations.

5.2 Parameter Groups

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

F0	Basic parameters	F9	Time parameters
F1	Motor parameters	FA	Keypad setting parameters
F2	Vector control parameters	FB	Door parameters
F3	Running control parameters	FC	Protection parameters
F4	Floor parameters	FD	Communication parameters
F5	Terminal input parameters	FE	Elevator function parameters
F6	Basic elevator parameters	FF	Factory parameters (reserved)
F7	Terminal output parameters	FP	User parameters
F8	Advanced function parameters	Fr	Leveling adjustment parameters

Group F0: Basic Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F0: Basic parameters					
F0-00	Control mode	0: SVC 2: V/F control	0	-	★

Set Value	Control Mode	Function	Encoder
0	SVC	Vector control, used for distance control operation of the NICE100+; Application: high-performance control of asynchronous motors	Not needed
2	V/F control	Open-loop V/F control, applicable to equipment detection; (The ratio between the voltage and the frequency is fixed, the control is simple, and the low-frequency output torque feature is poor.)	Not needed

F0-01	Command source selection	0: Operating panel control 1: Distance control	1	-	★

It is used to set the source of running commands and running speed references. The following table shows the details.

Parameter Value	Control Mode	Operation Mode		Application	Remarks
		(X) Input	(Y) Output		
0	Operating panel control	No judgment of X input signal	No output (RUN contactor of the controller outputs normally during motor auto-tuning)	For motor test or no-load auto-tuning only	Operated by pressing RUN and STOP on the operating panel, and the running speed is set by F0-02 (Running speed under operating panel control)
1	Distance control	Normal judgment of X input signal	Normal output	Control mode for normal elevator running	1) During inspection, the elevator runs at the speed set in F3-11 (Inspection speed). 2) During normal running, the controller automatically calculates the speed and running curve for the elevator based on the distance between the current floor and destination floor within the rated elevator speed, implementing direct travel ride.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F0: Basic parameters					
F0-02	Running speed under operating panel control	0.050 to F0-04	0.050	m/s	☆
F0-03	Running speed	0.200 to F0-04	0.480	m/s	★
F0-04	Rated elevator speed	0.200–1.000	0.500	m/s	★
F0-05	Maximum frequency	F1-04 to 99.00	50.00	Hz	★
F0-06	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 the carrier frequency is generally set above 6 kHz, quiet 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.
If the carrier frequency is low, the output current has high harmonics, and the power loss and temperature rise of the motor increase.
If the carrier frequency is high, the power loss and temperature rise of the motor declines. However, the system has an increase in power loss, temperature rise and interference.
Adjusting the carrier frequency will exert influences on the aspects listed in the following table.

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

Group F1: Motor Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F1: Motor Parameters					
F1-01	Rated power	0.7–75.0	Model dependent	kW	★
F1-02	Rated voltage	0–550	Model dependent	V	★
F1-03	Rated current	0.00–655.00	Model dependent	A	★
F1-04	Rated frequency	0.00–99.00	Model dependent	Hz	★
F1-05	Rated rotation speed	0–3000	Model dependent	rpm	★
F1-09	Current detection compensation	0–10.0	0.5	-	★

It is used to set the current detection compensation of the AC drive. A too large value may reduce the control performance.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F1: Motor Parameters					
F1-10	DSP fault block	0–65535	0	-	★
F1-11	Auto-tuning mode	0: No operation 1: Asynchronous motor static auto-tuning 1 2: Asynchronous motor static auto-tuning 2 3: Shaft auto-tuning 1 4: Shaft auto-tuning (clear leveling adjustment data)	0	-	★

It is used to select the auto-tuning mode. The options include:

Parameter Value	Auto-tuning mode	Function
0	No operation	None
1	Asynchronous motor static auto-tuning 1	Applicable to scenarios where the load cannot be removed and a complete auto-tuning is impossible. Stator resistance, rotor resistance, and leakage inductance will be auto-tuned.
2	Asynchronous motor static auto-tuning 2	Applicable to scenarios where the load cannot be removed and a complete auto-tuning is impossible. Stator resistance, rotor resistance, leakage inductance, mutual inductance, and no-load current will be auto-tuned.
3	Shaft auto-tuning 1	Leveling adjustment records in group Fr are preserved.
4	Shaft auto-tuning 2	Leveling adjustment records in group Fr are cleared.

F1-12	Pulses per revolution of the motor	0–10000	10	PPR	★

The valid signal pulses on the flywheel multiplied by 10 for each revolution of the motor (only valid for motor flywheel signal used as shaft signal).

F1-14	Asynchronous motor stator resistance	0.000–30.000	Model dependent	Ω	★

The valid signal pulses on the flywheel multiplied by 10 for each revolution of the motor (only valid for motor flywheel signal used as shaft signal).

F1-15	Asynchronous motor rotor resistance	0.000–30.000	Model dependent	Ω	★
F1-16	Asynchronous motor leakage inductive reactance	0.00–300.00	Model dependent	mH	★
F1-17	Asynchronous motor mutual inductive reactance	0.1–3000.0	Model dependent	mH	★
F1-18	Asynchronous motor magnetizing current	0.01–300.00	Model dependent	A	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F1: Motor Parameters					
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 on-site motor auto-tuning cannot be performed, manually enter the values by referring to data of the motor with the same nameplate parameters. Each time F1-01 (Rated power) of the asynchronous motor is modified, these parameters automatically restore to the default values.					
F1-25	Motor type	0: Asynchronous motor	0	-	●

Group F2: Vector Control Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					
F2-00	Speed loop proportional gain 1	0–100	40	-	★
F2-01	Speed loop integral time 1	0.01–10.00	0.60	s	★
F2-02	Switchover frequency 1	0.00 to F2-05	2.00	Hz	★
Speed loop proportional gain 1 (F2-00) and speed loop integral time 1 (F2-01) are Proportional-Integral (PI) regulation parameters when the running frequency is smaller than switchover frequency 1.					
F2-03	Speed loop proportional gain 2	0–100	35	-	★
F2-04	Speed loop integral time 2	0.01–10.00	0.80	s	★
F2-05	Switchover frequency 2	F2-02 to F0-05	5.00	Hz	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					

Speed loop proportional gain 2 (F2-03) and speed loop integral time 2 (F2-04) are PI parameters when the running frequency is larger than switchover frequency 2.
If the running frequency is between switchover frequency 1 and 2, the PI parameters are obtained from the weighted average value of F2-00 (Speed loop proportional gain 1) and F2-01 (Speed loop integral time 1), and F2-03 (Speed loop proportional gain 2) and F2-04 (Speed loop integral time 2), as shown in the following figure.

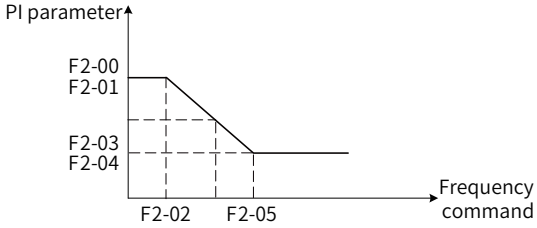


Figure 5-1 PI parameter diagram

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 or reduce the integral time. Be aware that either a too big gain or a too short time may lead to system oscillation.

We recommend the following adjustment method:
If the default setting cannot meet the requirements, make a 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 and small overshoot.
If both switchover frequency 1 and 2 are 0, only F2-03 (Speed loop proportional gain 2) and F2-04 (Speed loop integral time 2) are valid.

F2-06	Vector control slip gain	50–200	100	%	★

For SVC, this parameter is used to adjust the speed stability accuracy of the motor. Increase this parameter if the with-load speed is too low, and decrease this parameter if the with-load speed is too high.
For FVC, this parameter is used to adjust the output current of the AC drive under the same load.

F2-08	Torque upper limit	0.0–200.0	150.0	%	★

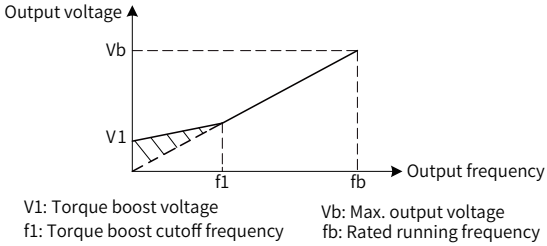
It is used to set the torque upper limit of the motor. 100% of this parameter equals the rated output torque of the compatible motor.

F2-09	Over-excitation gain	0–200	64	-	★

Over-excitation control can suppress the bus voltage increase during the deceleration of the AC drive to prevent overvoltage. The larger you set the over-excitation gain, the stronger the suppression becomes.
Increase the over-excitation gain for applications where overvoltage alarms are likely to happen during deceleration of the AC drive. However, a too large over-excitation gain may lead to an increased output current. This must be considered carefully in actual situations.
For applications where the inertia is small, the voltage increase does not occur during the deceleration of the motor. In this case, it is recommended to set the over-excitation gain to 0.
In case a braking resistor is equipped, it is also recommended to set the over-excitation gain to 0.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					
F2-10	Running direction	0: Direction unchanged 1: Direction reversed	0	-	★
It is used to set the elevator running direction. 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 successful motor auto-tuning, 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 so that the motor running direction is consistent with the inspection command direction. Pay attention to the setting of F2-10 when restoring default settings.					
F2-13	Excitation regulation proportional gain	0–60000	2000	-	★
F2-14	Excitation regulation integral gain	0–60000	1300	-	★
F2-15	Torque regulation proportional gain	0–60000	2000	-	★
F2-16	Torque regulation integral gain	0–60000	1300	-	★
These parameters are current loop PI regulation parameters in vector control. They are obtained automatically after asynchronous motor dynamic auto-tuning and does not need to be modified. The integral regulator of the current loop does not use the integral time as the dimension but directly sets the integral gain. If the current loop PI gain is set too large, the entire control loop will oscillate. Therefore, if the current oscillation or the torque fluctuation is too large, you can manually reduce the PI proportional gain or integral gain.					
F2-17	Random PWM depth	0–10	0	-	★
This parameter is used to set the random PWM to soften the ear-piercing motor noise and reduce electromagnetic interference. If F2-17 is set to 0, the random PWM is invalid. Different random PWM depths achieves different noise-reduction effects.					
F2-18	Startup acceleration time	0.000–1.500	0.000	s	★
This parameter is used to set the acceleration time at startup speed and used together with F3-00 (Startup speed). For details, see "Figure 5-3 Speed curve diagram" on page 62.					
F2-19	Asynchronous motor SCV2, M-axis current loop proportional coefficient	5–300	20	-	☆
F2-20	Asynchronous motor SCV2, M-axis current loop integral coefficient	0–65535	0	-	☆
F2-21	Asynchronous motor SCV flux observation compensation coefficient	0–200	100	%	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					
F2-22	Asynchronous motor SCV flux observation low-pass filter cutoff frequency	100–2000	500	-	☆
F2-23	Asynchronous motor SCV, added M-axis current loop proportional closed-loop gain	0–500	200	-	☆
F2-24	Asynchronous motor SCV, added T-axis current loop proportional closed-loop gain	0–500	0	-	☆
F2-25	SVC excitation current boost	0.0–50.0	10.0	%	☆
F2-26	SVC excitation current boost cutoff frequency	0 to F1-04	20.00	Hz	★
F2-27	SVC speed loop filter	0.000–0.100	0.000	-	☆
F2-28	SVC torque limit mode selection	0–1000	0	-	☆
F2-29	SVC2 speed filter coefficient	0.000–1.000	0.050	-	☆
F2-30	Exciting current coefficient	1–1000	100	-	☆
F2-31	Torque limit filter coefficient	0–63	63	-	☆
F2-32	Pulse-by-pulse current limit interruption	0–65535 0: Enabled 1: Disabled	0	-	☆
F2-33	Special treatment of synchronous frequency at SVC output phase loss detection	0–65535 0: Enabled 1: Disabled	0	-	☆
F2-34	Input phase loss detection time	0–65535 1: 2s 0: 1s	0	-	☆
F2-43	V/F torque boost gain	0.0–30.0	0.0	%	☆
F2-44	V/F torque boost cutoff frequency	0.00 to F0-05	4.00	Hz	★

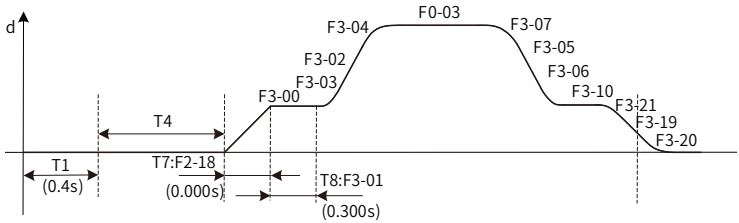
Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					
In V/F control mode, F2-43 compensates for insufficient torque production by boosting output voltage of the AC drive. A very large setting may result in motor overheating and overcurrent of the AC drive. If the startup torque of the motor is not sufficient when the load is heavy, it is recommended to increase the value of F2-43. If the load is light the torque boost can be reduced. If F2-43 is set to 0.0, fixed torque boost is enabled. The AC drive automatically determines the required torque boost value according to parameters such as the stator resistance of the motor. Under the set V/F torque boost cutoff frequency, the torque boost is valid. If the output frequency exceeds this value, the torque boost becomes invalid. The following figure shows the details.  Figure 5-2 Torque boost diagram					
F2-45	V/F slip compensation gain	0.0–200.0	100.0	%	☆
This parameter is only valid for asynchronous motors. VF slip compensation is used to compensate the RPM difference generated during load increase of the asynchronous motor, so that the rotation speed is kept stable during load changes. If the VF slip compensation gain is set to 100.0%, it indicates that the compensated RPM at rated load of the motor is the rated slip of the motor. The rated slip is automatically calculated based on rated frequency and RPM in group F1. When adjusting VF slip compensation gain, keep the motor RPM basically the same as the rotation speed reference under rated load. If the motor RPM is different from the rotation speed reference, increase the gain slightly.					
F2-46	V/F over-excitation gain	0–200	0	-	☆
Over-excitation control can suppress the voltage increase of the bus during the deceleration of the AC drive to prevent overvoltage faults. The larger you set the over-excitation gain, the stronger the suppression becomes. In case overvoltage alarms are likely to happen during the deceleration of the AC drive, the over-excitation gain needs to be increased. However, if the over-excitation gain is too large, the output current will increase. This must be considered carefully in actual situations. In case the inertia is small, there will not be any voltage increase during deceleration of the motor. In this case, it is recommended to set the over-excitation gain to 0. In case a braking resistor is equipped, it is also recommended to set the over-excitation gain to 0.					
F2-47	V/F oscillation suppression gain	0–100	30	-	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					
Keep this parameter value as small as possible to the extent that the oscillation can be suppressed effectively. This will not negatively impact the VF operation. If there is no oscillation in the motor, set this parameter to 0. Increase this parameter only if there is apparent oscillation in the motor. The larger the gain is set, the stronger the result of suppression becomes. Ensure that the parameters of rated current and no-load current are accurate. Otherwise the suppression is ineffective.					
F2-48	V/F oscillation suppression mode	0–4	3	-	☆
F2-49	V/F overcurrent stall point	50–200	170	-	☆
F2-50	V/F overcurrent stall enabling bit	0–1	1	-	☆
F2-51	V/F overcurrent stall frequency modulation Kp	0–100	20	-	☆
F2-52	V/F multiplying speed overcurrent stall action current compensation coefficient	50–200	50	-	☆
Parameter description: F2-49: If the current exceeds the overcurrent stall point, the overcurrent stall prevention is effective. The actual acceleration time is prolonged automatically. F2-52: This parameter reduces the high-speed overcurrent stall action current. When the compensation coefficient is 50, this parameter is invalid. The action current in flux weakening area corresponds to the parameter F2-49 (V/F overcurrent stall point). In high-frequency applications, the drive current of the motor is relatively low. However, when the motor runs at rated frequency, the same stall current causes a big drop of motor speed. To improve the motor performance, you can decrease the stall action current when the motor runs at the rated frequency or above. In applications such as centrifuge with high running frequency, severalfold flux weakening and relatively big load inertia, this method improves the performance of acceleration. The overcurrent stall action current at rated frequency or above = "(fs/fn) x k x LimitCur". In this formula, "Fs" is the running frequency, "fn" is the rated motor frequency, k is F2-52 (V/F multiplying speed overcurrent stall action current compensation coefficient), and LimitCur is F2-49 (V/F overcurrent stall point). Note: ◆ 150% of overcurrent stall action current indicates 1.5 times of the rated current of the AC drive. ◆ For high power motors, if the carrier frequency is below 2 kHz, the pulse-by-pulse current limit responds before overcurrent stall prevention due to an increase of pulse current. This leads to insufficient torque of the motor. In this case, decrease the overcurrent stall prevention current. Bus voltage limit of the AC drive and open voltage setting for braking resistors: If the bus voltage exceeds the overvoltage stall point by 760 V, it indicates that the system is in power generation state (motor RPM > output frequency) and the overvoltage stall protection will be effective. The output frequency is adjusted (the energy outside of the regenerative energy is consumed), and the actual deceleration time is automatically prolonged to prevent tripping. If the actual deceleration time cannot meet the requirement, increase the over-excitation gain properly.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F2: Vector Control Parameters					
F2-53	V/F overvoltage stall point	650.0–800.0	770.0	V	☆
F2-54	V/F overvoltage stall enabling bit	0–1	0	-	☆
F2-55	V/F overvoltage stall frequency modulation Kp	0–100	30	-	☆
F2-56	V/F overvoltage stall voltage regulation Kp	0–100	30	-	☆
F2-57	Maximum frequency of V/F overvoltage stall increase	0–50	5	-	☆
F2-58	V/F undervoltage stall enabling bit	0–2	0	-	☆
F2-59	V/F undervoltage stall frequency modulation Kp	0–100	40	-	☆
F2-60	V/F undervoltage stall frequency modulation Ki	0–100	30	-	☆
F2-61	V/F undervoltage stall recovery judgment voltage	85–120	85	-	☆
F2-62	V/F undervoltage stall recovery judgment voltage time	0.1–10.0	0.5	-	☆
F2-63	V/F undervoltage stall point	60–85	80	-	☆
F2-65	V/F slip compensation response time	0.1–10.0	0.5	s	☆
If the value of F2-65 is set too small, big load inertia is likely to cause overvoltage fault (Err07). The smaller the value of F2-65 is, the quicker the response is.					
F2-66	V/F slip compensation suspension	0–1	0	-	☆

Group F3: Running Control Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F3: Running Control Parameters					
F3-00	Startup speed	0.000–0.030	0.008	m/s	★
F3-01	Startup speed holding time	0.000–0.500	0.200	s	★
These two parameters are used to set the startup speed and startup speed holding time. For details, see *"Figure 5-3 Speed curve diagram" on page 62*. The parameters may reduce the terrace feeling at startup due to static friction between the guide rail and guide shoes.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F3: Running Control Parameters					
F3-02	Acceleration rate	0.200–0.800	0.600	m/s^2	★
F3-03	Acceleration jerk time 1	0.300–4.000	1.000	s	★
F3-04	Acceleration jerk time 2	0.300–4.000	1.000	s	★
These parameters are used to set the running curve during acceleration of the elevator.					
F3-05	Deceleration rate	0.200–0.800	0.600	m/s^2	★
F3-06	Deceleration jerk time 1	0.300–4.000	1.000	s	★
F3-07	Deceleration jerk time 2	0.300–4.000	1.000	s	★
These parameters are used to set the running curve during deceleration of the elevator. F3-02 (F3-05) is the acceleration rate (deceleration rate) in the straight-line acceleration process (deceleration process) of the S curve. F3-03 (F3-07) is the time for the acceleration rate (deceleration rate) to increase from 0 to the value set in F3-02 (F3-05) in the end jerk segment of the S curve. The larger the value is, the smoother the jerk is. F3-04 (F3-06) is the time for the acceleration rate (deceleration rate) to decrease from the value set in F3-02 (F3-05) to 0 in the start jerk segment of the S curve. The larger the value is, the smoother the jerk is.					
The running curve is as follows:  Figure 5-3 Speed curve diagram					
F3-08	Special deceleration rate	0.200–2.000	0.500	m/s^2	★
It is used to set the deceleration rate during 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, preventing over travel top terminal or over travel bottom terminal.					
F3-09	Pre-deceleration distance	100.0–900.0	200.0	mm	★
It is used to set the pre-deceleration distance of the elevator. This function can eliminate the influence of encoder signal loss or leveling signal delay.					
F3-10	Low-speed creeping speed	0.050–0.200	0.050	m/s	★
This parameter is used to set the elevator speed when the car is approaching the door zone. The car moves to the door zone at the speed set in F3-10, and stops in the door zone after the second deceleration. The deceleration curve is determined by the parameters F3-19 to F3-21.					
F3-11	Inspection speed	0.100–0.500	0.250	m/s	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F3: Running Control Parameters					
It is used to set the elevator speed during inspection and shaft auto-tuning.					
F3-12	Position of up slow-down	0.000–300.00	0.00	m	★
F3-13	Position of down slow-down	0.000–300.00	0.00	m	★
These parameters specify the position of slow-down switches relative to the bottom leveling position, and the positions are automatically recorded during shaft auto-tuning. For the installation positions of slow-down switches, see *"Table 2-6 Terminal slow-down distances" on page 37*. The controller supports only one pair of slow-down switches, which are installed near the terminal floor. The control 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.					
F3-14	DC injection braking time at startup	0.000–3.000	0.300	s	★
F3-15	Brake release delay	0.000–3.000	0.050	s	★
F3-16	Running end delay time	0.000–3.000	0.200	s	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F3: Running Control Parameters					
These parameters are used to set the time related to the zero-speed holding current output and braking action delay. F3-14 (DC injection braking time at startup) specifies the valid time of DC injection braking output at startup, during which the controller performs excitation on the motor and outputs zero-speed current with large startup torque. F3-15 (Brake release delay) specifies the time from the moment when the system sends the brake release command to the moment when the brake is completely released, during which the system retains the zero-speed torque current output. F8-11 (Stop torque output delay) specifies the time from the moment when the brake is completely applied to the moment when the stop DC injection braking is canceled, during which the system retains the zero-speed torque current output. F3-16 (Running end delay time) specifies the time during which the system keeps output when the running curve ends (the output frequency is less than 0.5 Hz or the speed is lower than the value set in F3-25). The running time sequence is as follows.					

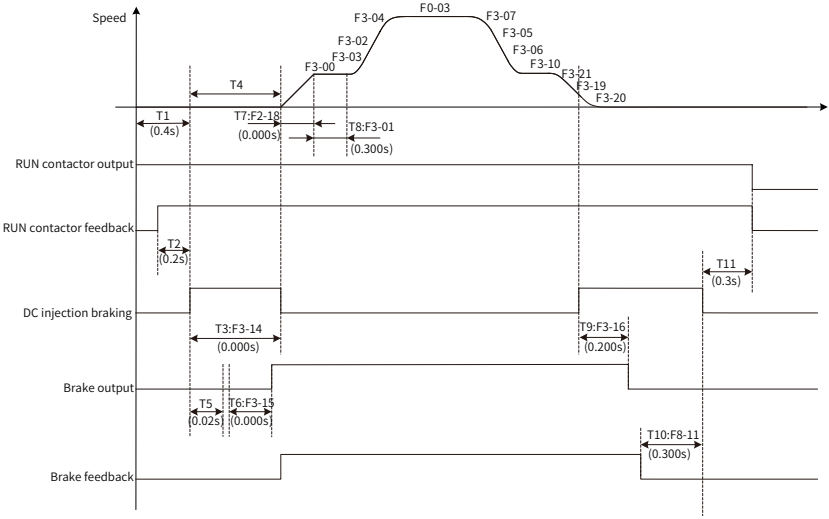


Figure 5-4 Running time sequence

F3-17	Low-speed re-leveling speed	0.080 to F3-11	0.100	m/s	★
It is used to set the elevator speed of returning to the leveling position at normal non-leveling stop.					
F3-18	Acceleration rate during emergency evacuation	0.050–0.500	0.100	m/s^2	★
F3-19	Creeping deceleration rate	0.200–0.800	0.300	m/s^2	★
F3-18 is used to set the acceleration rate during the emergency evacuation.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F3: Running Control Parameters					
F3-20	Creeping deceleration end	0.300–4.000	0.500	s	★
F3-21	Creeping deceleration start	0.300–4.000	0.500	s	★
F3-23	Breaking speed	0.000–0.100	0.000	m/s	★
F3-24	Breaking current	0–100	5	%	★
F3-25	Stop speed	0.000 to F3-10	0.005	m/s	★

Group F4: Floor Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F4: Floor Parameters					
F4-00	Shaft signal type	0–3 0: One deceleration signal, monostable 1: Motor flywheel signal 2: One deceleration signal, bistable 3: Two deceleration signals, monostable	0	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F4: Floor Parameters					

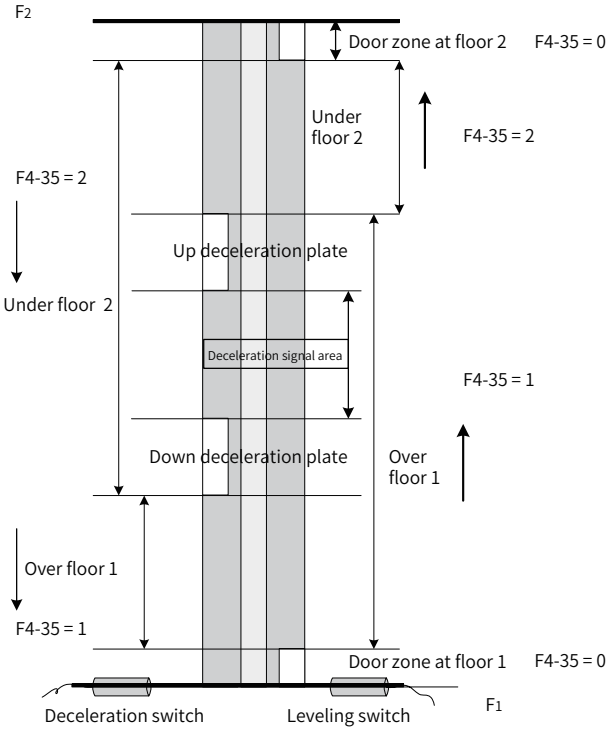
Value	Shaft Type	Function Description	Number of X Input Terminal
0	One deceleration signal (monostable)	1) Applicable to scenarios where deceleration switches are monostable and only one deceleration switch is installed on the car top; 2) The deceleration switch becomes effective once when the elevator passes the deceleration position during up/down running, and the deceleration information is collected by the same X terminal.	1
1	Motor flywheel signal (monostable)	1) Applicable to scenarios where deceleration switches are monostable and deceleration switches are installed on the motor flywheel; 2) During elevator running, a pulse is generated (the deceleration switch becomes effective once) for per motor revolution when the elevator passes the deceleration position. Note: The effective signal period must be larger than the response time of X terminal input (default: 20 ms).	1
2	One deceleration signal (bistable)	1) Applicable to scenarios where deceleration switches are bistable and only one deceleration switch is installed on the car top; 2) The open-loop deceleration switch becomes effective once when the elevator passes the deceleration position during up/down running, and the deceleration information is collected by the same X terminal.	1
3	Two deceleration signals (monostable)	1) Applicable to scenarios where deceleration switches are monostable and two deceleration switches (different sensors for up and down deceleration) are installed on the car top; 2) The open-loop deceleration switch becomes effective once when the elevator passes the deceleration position during up/down running, and the deceleration information is collected by two different X terminals.	2

F4-01	Current floor	F6-01 to F6-00	1	-	★
This parameter 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	High byte of current floor position	0–65535	1	Pulses	●
F4-03	Low byte of current floor position	0–65535	10000	Pulses	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F4: Floor Parameters					
These two parameters indicate the absolute pulses of the current position of the elevator car relative to the bottom leveling position. The position data 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.					
F4-04	Length 1 of leveling plate	0–65535	0	Pulses	★
F4-05	Length 2 of leveling plate	0–65535	0	Pulses	★
F4-06	High byte of floor height 1	0–65535	0	Pulses	★
F4-07	Low byte of floor height 1	0–65535	20	Pulses	★
F4-08	High byte of floor height 2	0–65535	0	Pulses	★
F4-09	Low byte of floor height 2	0–65535	20	Pulses	★
F4-10	High byte of floor height 3	0–65535	0	Pulses	★
F4-11	Low byte of floor height 3	0–65535	20	Pulses	★
F4-12	High byte of floor height 4	0–65535	0	Pulses	★
F4-13	Low byte of floor height 4	0–65535	20	Pulses	★
F4-14	High byte of floor height 5	0–65535	0	Pulses	★
F4-15	Low byte of floor height 5	0–65535	20	Pulses	★
F4-16	High byte of floor height 6	0–65535	0	Pulses	★
F4-17	Low byte of floor height 6	0–65535	20	Pulses	★
F4-18	High byte of floor height 7	0–65535	0	Pulses	★
F4-19	Low byte of floor height 7	0–65535	20	Pulses	★
F4-20	High byte of floor height 8	0–65535	0	Pulses	★
F4-21	Low byte of floor height 8	0–65535	20	Pulses	★
F4-22	High byte of floor height 9	0–65535	0	Pulses	★
F4-23	Low byte of floor height 9	0–65535	20	Pulses	★
F4-24	High byte of floor height 10	0–65535	0	Pulses	★
F4-25	Low byte of floor height 10	0–65535	20	Pulses	★
F4-26	High byte of floor height 11	0–65535	0	Pulses	★
F4-27	Low byte of floor height 11	0–65535	20	Pulses	★
These parameters indicate the pulses corresponding to the floor height i (the pulses corresponding to the distance between the leveling plates of floor i 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. In normal conditions, the floor height i of each floor is almost the same.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
F4: Floor Parameters					
F4-35	Current position area	0–65535 0: At leveling position 1: Over the current floor 2: Under the current floor	0	-	●

This parameter is used to display the position within the current floor where the elevator car is located. If the current position pulses are the same as the pulses calculated for the current floor, the direction for re-leveling can be determined. If the elevator is running up and is under the current floor, the system determines that the elevator gets closer to the leveling in up direction. When the elevator is running down and is over the current floor, the system determines that the elevator gets closer to the leveling in down direction. The following figure shows the details.



1) Re-leveling in non-door zone: if the car is within the deceleration signal area, it runs up to re-leveling.
2) Nearest floor first: the car re-levels to the nearest floor based on the pulses of the current door zone.

Group F5: Terminal Input Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					
F5-00	Attendant/ Automatic switchover time	3–200	3	-	★
If there is a hall call at current floor in the attendant state, the system automatically switches over to the automatic (normal) state after the time set in F5-00. After this running is completed, the system automatically restores to the attendant state (Bit2 of F6-67 must be set to 1). When the value of F5-00 is smaller than 5, the switchover function is disabled, and the system is in the attendant state.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					
F5-01	X1 function selection	1–99 (NO inputs); 101–199 (NC inputs) 00: Unused 01: Reserved 02: Reserved 03: Door zone signal 04: Running output feedback signal 05: Brake output feedback signal 06: Brake travel switch feedback signal 1 07: Reserved 08: Reserved 09: Inspection signal 10: Inspection up signal 10: Inspection down signal 12: FER signal 13: Reserved 14: Elevator lock signal 15: Up limit signal 16: Down limit signal 17: Up slow-down signal 18: Down slow-down signal 19: Overload signal 20: Full-load signal 21: Emergency stop (safety feedback) signal 22: Door 1 open limit signal 23: Reserved 24: Door 1 close limit signal 25: Reserved 26: Door 1 light curtain signal 27: Reserved 28: Attendant signal 29: Direct travel ride signal 30: Direction change signal 31: Reserved 32: Reserved 33: UPS input signal 34: Door open button 35: Door close button 36: Safety circuit 37: Door lock circuit 1 38: Door lock circuit 2 39: Half-load signal 40: Motor overheating signal 41: Door 1 safety edge signal 42: Door 2 safety edge signal 43: Earthquake signal 44: Reserved 45: Light-load signal 46: Reserved 47: Fire emergency floor switchover signal 48: Dummy floor input 49: Firefighter input 50: Brake travel feedback 2 51: Car lighting switch input 52: Car fan switch input 53: Up deceleration signal input 54: Down deceleration signal input 55: Single deceleration signal input (motor flywheel signal) 56 to 79: Reserved 80: Electromagnetic lock feedback input 81: Car STOP signal input	03	-	★
F5-02	X2 function selection		55	-	★
F5-03	X3 function selection		0	-	★
F5-04	X4 function selection		109	-	★
F5-05	X5 function selection		10	-	★
F5-06	X6 function selection		11	-	★
F5-07	X7 function selection		12	-	★
F5-08	X8 function selection		20	-	★
F5-09	X9 function selection		115	-	★
F5-10	X10 function selection		116	-	★
F5-11	X11 function selection		117	-	★
F5-12	X12 function selection		118	-	★
F5-13	X13 function selection		119	-	★
F5-14	X14 function selection		22	-	★
F5-15	X15 function selection		126	-	★
F5-16	X16 function selection		28	-	★
F5-17	X17 function selection		30	-	★
F5-18	X18 function selection		124	-	★
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	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					

X1 to X24 are DI terminals whose values can be set from 00 to 199. The same value must not be allocated to multiple terminals. If the input signal of X1 terminal is 24 V, the corresponding X1 signal indicator of the MCB becomes ON. Each function is indicated by its corresponding code:
00: Unused
The system does not respond even if there is an input signal. You can set the value of unused terminals to 00 to prevent misoperations.
01: Reserved
02: Reserved
03: Door zone signal
The controller determines the elevator leveling position based on the leveling sensor signal. If the leveling signal is abnormal (the leveling sensor is stuck or disconnected), the system reports fault Err22.
04: Running output feedback signal
05: Brake output feedback signal
06: Brake travel switch feedback signal 1
50: Brake travel switch feedback signal 2
The system detects the feedback from the RUN and brake contactors 2s after outputting the contactor disconnection signal to determine whether the related contactor is closed properly.
07: Reserved
08: Reserved
09: Inspection signal
10: 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 power operated door operations. When the inspection up signal or inspection down signal is valid, the elevator runs at the inspection speed.
12: FER signal
After 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.
13: Reserved
14: Elevator lock signal
When the elevator lock signal is active, the system enters the elevator lock state.
15: Up limit signal
16: Down limit signal
The up limit signal and down limit signal are used as the stop switches at terminal floors to prevent over travel top terminal or over travel bottom terminal when the elevator runs over the leveling position of the top/bottom terminal floor but does not stop.
17: Up slow-down signal
18: Down slow-down signal
These signals are set to NO input, corresponding to slow-down switch signals. The controller automatically records the position of slow-down switches in group F3 during shaft auto-tuning.
19: 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 tweets, the overload indicator in the car becomes ON, and the elevator door keeps open. The overload signal becomes invalid when the door lock is closed. If the running with 110% of the rated load is required during inspection, you can set Bit2 of F6-10 (Test function selection) to 1 to allow overload running.
20: Full-load signal
When the elevator load is 80% to 110% of the rated load, the elevator enters the full-load state and the hall display board displays "Full-load". The elevator does not respond to any hall call.
21: Emergency stop (safety feedback) signal
The safety circuit is important to guarantee the safe running of the elevator.
22: Door 1 open limit signal
The terminal with this function is used to receive the door open limit signal 1.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					

23: Reserved
24: Door 1 close limit signal
The terminal with this function is used to receive the door close limit signal 1.
25: Reserved
26: Door 1 light curtain signal
The terminal with this function is used to receive the light curtain 1 signal.
27: Reserved
28: Attendant signal
The elevator enters the attendant state after this signal is active.
29: Direct travel ride signal
The elevator does not respond to hall calls when this signal is active in attendant state.
30: Direction change signal
The elevator changes the running direction when this signal is active in attendant state.
31: Reserved
32: Reserved
33: UPS input signal
The terminal is used to receive the emergency running signal at power failure.
34: Door open button
The terminal is used to receive the door open input signal.
35: Door close button
The terminal is used to receive the door close input signal.
36: Safety circuit
The safety circuit is important to guarantee safe running of the elevator.
37: Door lock circuit 1
It is used to ensure that the hall door and car door have been closed when the elevator starts to run.
38: Door lock circuit 2
It has the same function as "Door lock circuit 1", ensuring that users can separate hall door signals and car door signals. The system considers that the door lock is closed only when door lock signal 1 and door lock signal 2 are both active.
39: Half-load signal
When the car load exceeds half of the limit, this signal becomes active. It is used to judge the emergency running direction at power failure.
40: Motor overheating signal
It is used for motor overheating protection switch signal input. If this signal remains active for more than 2s, the controller stops output and reports fault Err39 to prompt motor overheating.
41: Door 1 safety edge signal
This is used to detect the safety edge signal state of door 1.
42: Reserved
43: Earthquake signal
If this signal remains active for more than 2s, the elevator enters the earthquake state and stops running, moves at the nearest landing floor and opens the door to let passengers out. The elevator starts running again after the earthquake signal becomes inactive.
44: Reserved
45: Light-load
It is used for nuisance judgment in the anti-nuisance function. If Bit2 of F8-13 is set to 1, the system performs nuisance judgment using the light-load switch. The load below 30% of the rated load is regarded as light-load.
46: Reserved
47: Fire emergency floor switchover signal
The controller 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.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					

48: Dummy floor input
This signal is required when the floor height is too large.
If the floor height is too large, the time protection may be enabled and the system reports Err30 after a long-time running. To solve the problem, you need to set a dummy floor input at a proper intermediate position of the floor. The elevator clears the counted protection time after arriving at this position so that the system will not report Err30.
49: Firefighter input
It is the firefighter switch signal and is used to enable the firefighter running function. After the elevator returns to the fire emergency floor, the elevator enters the firefighter running state if the firefighter signal is active.
51: Car lighting switch input
This parameter is used to enable the use of car lighting.
52: Car fan switch input
This parameter is used to enable the use of car fan.
53: Up deceleration signal input
54: Down deceleration signal input
This parameter is used for the shaft type where separate deceleration sensors are used to detect deceleration signal inputs during up running and down running of the elevator (F4-00 = 3).
55: Motor flywheel signal input
This parameter is used for the shaft type where the same deceleration sensor is used to detect deceleration signal input (F4-00 = 0 or 2) or motor flywheel signal input (F4-00 = 1) during up running and down running of the elevator.
56 to 99: Reserved
101 to 199: These signals respectively correspond to 01 to 99 in sequence. 01 to 99 are NO inputs, while 101 to 199 are NC inputs.

F5-25	X25 higher-voltage input function selection	1–16 00: Unused 01: Safety circuit signal 02: Door lock circuit 1 signal 03: Door lock circuit 2 signal 04–16: Reserved	01	-	★
F5-26	X26 higher-voltage input function selection		02	-	★
F5-27	X27 higher-voltage input function selection		03	-	★

00: Unused
The system does not respond even if there is an input signal. You can set the value of unused terminals to 00 to prevent misoperations.
01: Safety circuit signal
The terminal with this function is used to detect the higher-voltage signal feedback of the safety circuit.
02: Door lock circuit 1 signal
The terminal with this function is used to detect the higher-voltage signal feedback of the door lock circuit, including the hall door circuit and car door lock circuit.
03: Door lock circuit 2 signal
The terminal with this function is used to detect the higher-voltage signal feedback of the door lock circuit, including the hall door circuit and car door lock circuit.
04 to 16: Reserved

F5-28	I/O terminal state display 1	-	-	-	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					
F5-29	I/O terminal state display 2	-	-	-	●

After you enter the F5-28 menu, the LED segments display the state of I/O terminals. The LEDs are numbered 1 to 5 from right to left. The segments are defined as follows:

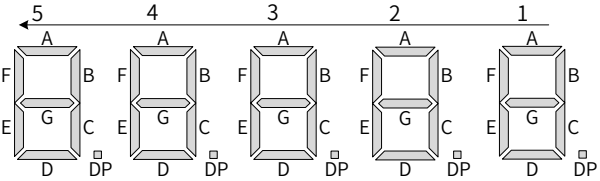


Figure 5-5 I/O terminal state indicated by F5-28

F5-28 indicates I/O terminal state 1. The following table describes the meaning of each LED segment.

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
1	A	Unused	Not applicable
	B	Leveling 1 signal	Leveling 1 signal active
	C	Leveling 2 signal	Leveling 2 signal active
	D	Door zone signal	Door zone signal active
	E	Running output feedback signal	Running output feedback signal active
	F	Brake output feedback signal 1	Brake output feedback signal 1 active
	G	Brake output feedback signal 2	Brake output feedback signal 2 active
	DP	Shorting motor stator feedback signal	Shorting PMSM stator feedback signal active
2	A	Shorting door lock circuit output feedback signal	Shorting door lock circuit output feedback signal active
	B	Inspection signal	Inspection signal active
	C	Inspection up signal	Inspection up signal active
	D	Inspection down signal	Inspection down signal active
	E	Fire emergency return (FER) signal	FER signal active
	F	Reserved	Reserved
	G	Elevator lock signal	Elevator lock signal active
	DP	Up limit signal	Up limit signal active
3	A	Down limit signal	Down limit signal active
	B	Up slow-down signal	Up slow-down signal active
	C	Down slow-down signal	Down slow-down signal active
	D	Overload signal	Overload signal active
	E	Full-load signal	Full-load signal active
	F	Emergency stop (safety circuit feedback) signal	Emergency stop (safety circuit feedback) signal active
	G	Door 1 open limit signal	Door 1 open limit signal active
	DP	Reserved	Reserved

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property

Group F5: Terminal Input Parameters

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
4	A	Door 1 close limit signal	Door 1 close limit signal active
	B	Reserved	Reserved
	C	Door 1 light curtain signal	Door 1 light curtain signal active
	D	Reserved	Reserved
	E	Attendant signal	Attendant signal active
	F	Direct travel ride signal	Direct travel ride signal active
	G	Direction change signal	Direction change signal active
	DP	Independent running signal	Independent running signal active
5	A	Reserved	Reserved
	B	UPS input signal	UPS input signal active
	C	Door open button	Door open button active
	D	Door close button	Door close button active
	E	Door lock circuit 1 (low-voltage input)	Door lock circuit 1 signal active
	F	Door lock circuit 2 (low-voltage input)	Door lock circuit 2 signal active
	G	Half-load signal	Half-load signal active
	DP	Unused	Not applicable

F5-29 indicates I/O terminal state 2. The following table describes the meaning of each LED segment.

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
1	A	Unused	Not applicable
	B	Safety circuit signal	Safety circuit signal active
	C	Door lock circuit 1 signal (higher-voltage input)	Door lock circuit 1 signal active
	D	Door lock circuit 2 signal (higher-voltage input)	Door lock circuit 2 signal active
	E	Unused	Not applicable
	F	Unused	Not applicable
	G	Unused	Not applicable
	DP	Unused	Not applicable

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
2	A	Y0 output	Y0 output active
	B	RUN contactor output	RUN contactor output active
	C	Brake contactor output	Brake contactor output active
	D	Higher-voltage startup of brake	Higher-voltage startup of brake active
	E	Fan/Lighting output	Fan/Lighting output active
	F	Shorting PMSM stator output	Shorting PMSM stator output active
	G	Door 1 open output	Door 1 open output active
	DP	Door 1 close output	Door 1 close output active
3	A	Reserved	Reserved
	B	Reserved	Reserved
	C	Low 7-segment a display output	Low 7-segment a display output active
	D	Low 7-segment b display output	Low 7-segment b display output active
	E	Low 7-segment c display output	Low 7-segment c display output active
	F	Low 7-segment d display output	Low 7-segment d display output active
	G	Low 7-segment e display output	Low 7-segment e display output active
	DP	Low 7-segment f display output	Low 7-segment f display output active
4	A	Low 7-segment g display output	Low 7-segment g display output active
	B	Up arrow display output	Up arrow display output active
	C	Down arrow display output	Down arrow display output active
	D	Minus sign display output	Minus sign display output active
	E	Fire emergency floor arrival signal output	Fire emergency floor arrival signal output active
	F	Buzzer output	Buzzer output active
	G	Overload output	Overload output active
	DP	Arrival gong output	Arrival gong output active
5	A	Full-load output	Full-load output active
	B	Inspection output	Inspection output active
	C	Fan/Lighting output 2	Fan/Lighting output 2 active
	D	Shorting door lock circuit relay output	Shorting door lock circuit relay output active
	E	BCD/Gray code/7-segment high-bit output	BCD/Gray code/7-segment high-bit output active
	F	Controller normal running output	Controller normal running output active
	G	Unused	Not applicable
	DP	Unused	Not applicable

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					
F5-30	Floor I/O terminal state display 1	-	-	-	●

After you enter the F5-30 menu, the LED segments display the state of I/O terminals. The LEDs are numbered 1 to 5 from right to left. The segments are defined as follows:

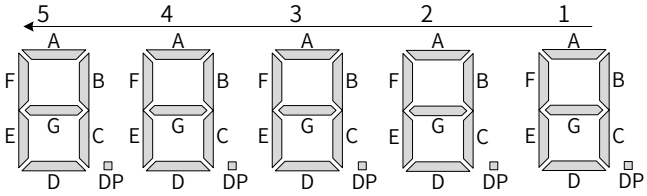


Figure 5-6 Floor I/O terminal state indicated by F5-30

F5-30 indicates floor I/O terminal state 1. The following table describes the meaning of each LED segment.

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
1	A	Door 1 open button I/O	Door 1 open button I/O active
	B	Door 1 close button I/O	Door 1 close button I/O active
	C	Door 1 open delay button I/O	Door 1 open delay button I/O active
	D	Floor 1 door 1 car call I/O	Floor 1 door 1 car call I/O active
	E	Floor 2 door 1 car call I/O	Floor 2 door 1 car call I/O active
	F	Floor 3 door 1 car call I/O	Floor 3 door 1 car call I/O active
	G	Floor 4 door 1 car call I/O	Floor 4 door 1 car call I/O active
	DP	Floor 5 door 1 car call I/O	Floor 5 door 1 car call I/O active
2	A	Floor 6 door 1 car call I/O	Floor 6 door 1 car call I/O active
	B	Floor 7 door 1 car call I/O	Floor 7 door 1 car call I/O active
	C	Floor 8 door 1 car call I/O	Floor 8 door 1 car call I/O active
	D	Floor 9 door 1 car call I/O	Floor 9 door 1 car call I/O active
	E	Floor 10 door 1 car call I/O	Floor 10 door 1 car call I/O active
	F	Reserved	Reserved
	G	Unused	Not applicable
	DP	Unused	Not applicable

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F5: Terminal Input Parameters					

LED No.	Segment	Meaning of Segment	Meaning of Segment ON
3	A	Floor 1 door 1 up call I/O	Floor 1 door 1 up call I/O active
	B	Reserved	Reserved
	C	Floor 2 door 1 up call I/O	Floor 2 door 1 up call I/O active
	D	Floor 2 door 1 down call I/O	Floor 2 door 1 down call I/O active
	E	Floor 3 door 1 up call I/O	Floor 3 door 1 up call I/O active
	F	Floor 3 door 1 down call I/O	Floor 3 door 1 down call I/O active
	G	Floor 4 door 1 up call I/O	Floor 4 door 1 up call I/O active
	DP	Floor 4 door 1 down call I/O	Floor 4 door 1 down call I/O active
4	A	Floor 5 door 1 up call I/O	Floor 5 door 1 up call I/O active
	B	Floor 5 door 1 down call I/O	Floor 5 door 1 down call I/O active
	C	Floor 6 door 1 up call I/O	Floor 6 door 1 up call I/O active
	D	Floor 6 door 1 down call I/O	Floor 6 door 1 down call I/O active
	E	Floor 7 door 1 up call I/O	Floor 7 door 1 up call I/O active
	F	Floor 7 door 1 down call I/O	Floor 7 door 1 down call I/O active
	G	Floor 8 door 1 up call I/O	Floor 8 door 1 up call I/O active
	DP	Floor 8 door 1 down call I/O	Floor 8 door 1 down call I/O active
5	A	Floor 9 door 1 up call I/O	Floor 9 door 1 up call I/O active
	B	Floor 9 door 1 down call I/O	Floor 9 door 1 down call I/O active
	C	Reserved	Reserved
	D	Floor 10 door 1 down call I/O	Floor 10 door 1 down call I/O active
	E	Reserved	Reserved
	F	Reserved	Reserved
	G	Unused	Not applicable
	DP	Unused	Not applicable

Group F6: Basic Elevator Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-00	Top serving floor of the elevator	F6-01 to 12	6	-	★
F6-01	Bottom serving floor of the elevator	1 to F6-00	1	-	★
These two parameters are used to set the top floor and bottom floor of the elevator, which is determined by the number of installed leveling plates.					
F6-02	Parking floor	F6-01 to F6-00	1	-	★
When the idle time of the elevator exceeds the value set in F9-00 (Idle time before returning to main floor), the elevator returns to the parking floor automatically.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-03	Fire emergency floor 1	F6-01 to F6-00	1	-	★
When entering the state of returning to the fire emergency floor, the elevator returns to this floor.					
F6-04	Elevator lock floor	F6-01 to F6-00	1	-	★
When entering the elevator lock state, the elevator returns to this floor.					
F6-05	Service floors	1: Respond to calls 2: Not respond to calls	65535	-	★

It is used to set the service floors.
This parameter is set as follows:
Whether a floor is a serving floor is determined by a 16-bit binary number. The 16 bits represent floor 1 to floor 16 respectively from low bit to high bit.

If a bit is set to 1, the elevator responds to calls at this floor. If this bit is set to 0, the elevator does not respond to calls at this floor. The service floors for a 12-floor elevator are shown as follows:

Bit	Floor	Service or not	Value	Bit	Floor	Service or not	Value
Bit0	Floor 1	In service	1	Bit8	Floor 9	Not in service	0
Bit1	Floor 2	Not in service	0	Bit9	Floor 10	In service	1
Bit2	Floor 3	In service	1	Bit10	Floor 11	In service	1
Bit3	Floor 4	In service	1	Bit11	Floor 12	Not in service	0
Bit4	Floor 5	In service	1	Bit12	Reserved	None	
Bit5	Floor 6	In service	1	Bit13	Reserved	None	
Bit6	Floor 7	In service	1	Bit14	Reserved	None	
Bit7	Floor 8	Not in service	0	Bit15	Reserved	None	

Convert the binary value to decimal: 1111 0110 0111 1101 = 63101
Then, enter "63101" for F6-05 on the operating panel.

F6-06	Elevator function control 1	Bit1: Returning to main floor if the position deviation is too large Bit3: Buzzer not tweet upon re-leveling Bit5: Auto reset cancellation of door lock fault Bit6: Floor number clearing and direction display in advance Bit8: Hall call not directional Bit10: Door lock disconnected once during switchover from inspection state to normal state	0	-	★

It is used to select the required elevator functions. Each bit of this parameter defines a function: If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.
The following table describes the bits.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					

F6-06: Elevator Function Control 1			
Bit	Function	Description	Default
Bit1	Returning to main floor if the position deviation is too large	The elevator stops at nearest landing floor and then returns to the main floor for verification when the car position deviation is too large.	0
Bit2	Reserved	Reserved	-
Bit3	Buzzer not tweet upon re-leveling	The buzzer output relay does not work upon re-leveling.	0
Bit5	Auto reset cancellation of door lock fault	The door lock fault cannot be reset automatically.	0
Bit6	Floor number clearing and direction display in advance	The displayed floor number is cleared before the elevator reaches the destination floor. If the elevator needs to change the running direction, the changed direction is displayed in advance.	0
Bit8	Hall call not directional	It is used for applications where there is only one hall call button. The hall call input can be connected to the up button input terminal and down button input terminal for this floor on the MCB.	0
Bit10	Door lock disconnected once during switchover from inspection state to normal state	When the inspection state switches over to the normal state, the elevator can enter the normal state only after the door lock is disconnected once.	0

F6-07	Elevator function control 2	Bit2: Arrow blinking during running Bit3: Elevator lock in the attendant state Bit6: Fault code not displayed on the keypad Bit9: Stop holding at brake feedback abnormal Bit10: Cancelling Err30 detection at re-leveling Bit12: Auto reset of faults Bit14: Floor display not reset upon up slow-down Bit15: Floor display not reset upon down slow-down	0	-	★

It is used to select the required elevator functions. Each bit of the function code defines a function: If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled.
The following table describes the bits.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					

F6-07: Elevator Function Control 2			
Bit	Function	Description	Default
Bit2	Arrow blinking during running	The arrow displayed on the display board blinks during elevator running. The blinking interval is set in F6-08 (Arrow blinking interval).	0
Bit3	Elevator lock in the attendant state	The elevator lock function can be enabled in the attendant state.	0
Bit6	Fault code not displayed on the keypad	The fault code is not displayed on the keypad of the MCB.	0
Bit9	Stop holding at brake feedback abnormal	When the brake feedback is abnormal, the AC drive retains the holding torque output.	0
Bit10	Canceling Err30 detection at re-leveling	Err30 is not judged during re-leveling.	0
Bit12	Auto reset of faults	The controller automatically resets the faults once every hour.	0
Bit14	Floor display not reset upon up slow-down	Floor display is not reset when the up slow-down signal is active, but floor display is reset when the down slow-down signal is active (only when the super short floor function is enabled)	
Bit15	Floor display not reset upon down slow-down	Floor display is not reset when the down slow-down signal is active, but floor display is reset when the up slow-down signal is active (only when the super short floor function is enabled)	

F6-08	Arrow blinking interval	0–5.0	1.0	-	★
F6-09	Random test times	0–60000	0	-	★
F6-10	Test function selection	Bit0: Hall call forbidden Bit1: Door open forbidden Bit2: Overload allowed Bit3: Limit switches forbidden	0	-	★

Bit0: Hall call forbidden. The elevator does not respond to hall calls if it is set to 1. It is automatically restored to 0 at power failure.
Bit1: Door open forbidden. The elevator does not automatically open the door if it is set to 1. It is automatically restored to 0 at power failure.
Bit2: Overload forbidden. The overload function does not take effect if it is set to 1. It is automatically restored to 0 at power failure so that the overload function is enabled when the elevator runs at 110% of the rated load.
Bit3: Limit forbidden. Limit protection is disabled when it is set to 1. It is automatically restored to 0 at power failure so that you can test the final limit switches during inspection. The setting is valid only to the current time.
Bit 4 to Bit 15: Reserved
Note that F6-10 can be set only by professionals with caution. The consequence is borne by the person who performs the setting. Ensure that F6-10 is set to 0 during normal elevator running.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-11	L1 function selection	00: Unused 201 to 203: Door 1 open/close 205 to 209: Reserved 210 to 229: Door 1 car call 230 to 249: Door 1 up hall call 250 to 269: Door 1 down hall call 270 to 399: Reserved 201: Door 1 open button 202: Door 1 close button 203: Door 1 open delay button 204: Reserved 205 to 210: Reserved 211: Floor 1 door 1 car call 212: Floor 2 door 1 car call 213: Floor 3 door 1 car call 214: Floor 4 door 1 car call 215: Floor 5 door 1 car call 216: Floor 6 door 1 car call 217: Floor 7 door 1 car call 218: Floor 8 door 1 car call 219: Floor 9 door 1 car call 220: Floor 10 door 1 car call 221: Floor 11 door 1 car call 222: Floor 12 door 1 car call 223: Reserved 224: Reserved 225: Reserved 226: Reserved 227 to 230: Reserved 231: Floor 1 door 1 up call 232: Floor 2 door 1 up call 233: Floor 3 door 1 up call 234: Floor 4 door 1 up call 235: Floor 5 door 1 up call 236: Floor 6 door 1 up call 237: Floor 7 door 1 up call 238: Floor 8 door 1 up call 239: Floor 9 door 1 up call 240: Floor 10 door 1 up call 241: Floor 11 door 1 up call 242: Reserved 243: Reserved 244: Reserved 245: Reserved 246 to 251: Reserved 252: Floor 2 door 1 down call 253: Floor 3 door 1 down call 254: Floor 4 door 1 down call 255: Floor 5 door 1 down call 256: Floor 6 door 1 down call 257: Floor 7 door 1 down call 258: Floor 8 door 1 down call 259: Floor 9 door 1 down call 260: Floor 10 door 1 down call	231	-	★
F6-12	L2 function selection		252	-	★
F6-13	L3 function selection		232	-	★
F6-14	L4 function selection		253	-	★
F6-15	L5 function selection		233	-	★
F6-16	L6 function selection		254	-	★
F6-17	L7 function selection		234	-	★
F6-18	L8 function selection		255	-	★
F6-19	L9 function selection		235	-	★
F6-20	L10 function selection		256	-	★
F6-21	L11 function selection		00	-	★
F6-22	L12 function selection		00	-	★
F6-23	L13 function selection		211	-	★
F6-24	L14 function selection		212	-	★
F6-25	L15 function selection		213	-	★
F6-26	L16 function selection		214	-	★
F6-27	L17 function selection		215	-	★
F6-28	L18 function selection		216	-	★
F6-29	L19 function selection		236	-	★
F6-30	L20 function selection		257	-	★
F6-31	L21 function selection		237	-	★
F6-32	L22 function selection		258	-	★
F6-33	L23 function selection		238	-	★
F6-34	L24 function selection		259	-	★
F6-35	L25 function selection		239	-	★
F6-36	L26 function selection		260	-	★
F6-37	L27 function selection		240	-	★
F6-38	L28 function selection		261	-	★
F6-39	L29 function selection		241	-	★
F6-40	L30 function selection		262	-	★
F6-41	L31 function selection		217	-	★
F6-42	L32 function selection		218	-	★
F6-43	L34 function selection		219	-	★
F6-44	L34 function selection		220	-	★
F6-45	L35 function selection		221	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-46	L36 function selection	261: Floor 11 door 1 down call 262: Floor 12 door 1 down call 263: Reserved 264: Reserved 265: Reserved 266: Reserved 267 to 299: Reserved	222	-	★
F6-47	L37 function selection		00	-	★
F6-48	L38 function selection		00	-	★
F6-49	L39 function selection		00	-	★
F6-50	L40 function selection		00	-	★
F6-51	L41 function selection		00	-	★
F6-52	L42 function selection		00	-	★
F6-61	Leveling sensor delay	10–50	14	ms	★
F6-62	Time interval of random running	0–1000	3	-	☆
F6-64	Program function selection 1	Bit1: Reserved Bit4: Reserved Bit5: Clearing calls immediately at elevator lock Bit9: Disabling reverse floor number clear Bit11: Responding to car calls first	0	-	★

F6-64: Program Function Selection 1			
Bit	Function	Description	Default
Bit5	Clearing calls immediately at elevator lock	When the elevator lock signal is active, the system immediately clears the registered calls and enables the elevator to stop at the nearest floor and then return to the elevator lock floor.	0
Bit9	Disabling reverse floor number clear	The system clears all car calls by default every time the elevator changes the running direction. When Bit9 is valid, the function of clearing reverse floor numbers is disabled.	0
Bit11	Responding to car calls first	The system responds to hall calls only after executing all car calls.	0

F6-65	Program function selection 2	Bit2: Decelerating to stop during inspection running Bit4: Buzzer tweeting during door open delay Bit8: Door open holding at elevator lock Bit9: Hall call display available at elevator lock Bit11: Blinking at arrival	0	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					

F6-65: Program Function Selection 2

Bit	Function	Description	Default
Bit2	Decelerating to stop during inspection running	During inspection running, if the slow-down switch 1 acts, the system decelerates to stop.	0
Bit4	Buzzer tweeting during door open delay	The buzzer tweets when the door open delay time defined by FB-13 is reached.	0
Bit8	Door open holding at elevator lock	In the elevator lock state, the elevator keeps the door open at the elevator lock floor.	0
Bit9	Hall call display available at elevator lock	In the elevator lock state, hall calls are displayed normally.	0
Bit11	Blinking at arrival	The car display blinks when the elevator arrives at a floor. The blinking advance time is set in F6-74.	0

F6-66	Program function 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 main floor for verification at first-time power-on	0	-	★

F6-66: Program Function Selection 3

Bit	Function	Description	Default
Bit1	Canceling door open/ close command at delay after door open/ close limit	If this function is enabled, the door open/close command is canceled at a 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 main 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

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-67	Attendant function selection	Bit0: Calls canceled after entering attendant state Bit1: No respond 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	128	-	★

Each bit of this parameter defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. The following table describes the details of these bits.

F6-67: Attendant Function Selection			
Bit	Function	Description	Default
Bit0	Calls canceled after entering attendant state	All car calls and hall calls are canceled after the elevator enters the attendant state for the first time.	0
Bit1	No respond to hall calls	The car blinks to prompt the hall call floors, but the elevator does not respond to hall calls automatically.	0
Bit2	Attendant/Automatic state switchover	If this function is enabled, the setting of F5-00 (Attendant/Normal switchover time) 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 for 2.5s at intervals.	0
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

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-68	Fire emergency function selection	Bit0: Automatic entering of fire emergency state when the fire emergency switch is active 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 Bit9: Displaying hall calls in fire emergency state Bit11: Exiting fire emergency state after arriving at the 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 in fire emergency floor	16457	-	★
Each bit of the parameter defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. The following table describes the bits.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					

F6-68: Fire Emergency Function Selection			
Bit	Function	Description	Default
Bit0	Automatic entering of fire emergency state when the fire emergency switch is active	Once the fire emergency switch is active, the elevator returns to fire emergency floor, keeps door open and enter the fire emergency state.	1
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 states will be recorded at power failure and be restored at next power-on.	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
Bit9	Displaying hall calls in fire emergency state	Hall calls are displayed in the fire emergency state.	0
Bit11	Exiting fire emergency state after arriving at the fire emergency floor	The system can exit the fire emergency 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 registered car calls are not cleared at reverse door open.	0
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 in fire emergency floor	The door opens automatically after the elevator arrives at the fire emergency floor.	0

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-69	Emergency evacuation function selection	Bit0/Bit1: Direction determine mode Bit2: Stopping at evacuation parking floor Bit4: Reserved Bit8: Emergency running time protection Bit10: Emergency buzzer output Bit12: Reserved Bit13: Reserved Bit14: Emergency evacuation exit mode Bit15: Emergency evacuation by ARD	0	-	★

Each bit of this parameter defines a function. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. The following table describes the details of these bits.

F6-69: Emergency Evacuation Function Selection									
Bit	Function	Description							Default
Bit0	Direction determine mode	0	Automatic calculation of direction (Running in heavy load direction, selected in no-load-cell mode.)	0	Reserved	1	Direction of nearest landing floor		0
Bit1		0		1		0			0
Bit2	Stopping at evacuation parking floor	During evacuation running, the elevator arrives at the evacuation parking floor set in F6-73 (it must be a non-zero value and is a service floor). Otherwise, the elevator stops at the nearest floor.							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.							0
Bit10	Emergency buzzer output	The buzzer tweets at intervals in the emergency running state.							0
Bit14	Emergency evacuation exit mode	0	The elevator exits emergency evacuation when receiving the door open limit signal after arrival at the destination floor.						0
		1	The elevator exits emergency evacuation when receiving the door close limit signal after arrival at the destination floor.						
Bit15	Emergency evacuation by ARD	Bit15 is used to enable functions related to evacuation by ARD. When this bit is valid, the motor is driven by ARD during the emergency evacuation.							0

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F6: Basic Elevator Parameters					
F6-73	Evacuation parking floor	0 to F6-00	0	-	★
It is used to set the evacuation parking floor when Bit2 (Stopping at evacuation parking floor) of F6-69 is valid.					
F6-74	Blinking advance time	0.0–15.0	1	s	★
It is used to set the blinking advance time when the elevator arrives at the floor required by the car call.					

Group F7: Terminal Output Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F7: Terminal Output Parameters					
F7-00	Y0 function selection	(Y0 is the special output terminal used for emergency evacuation at power failure) Setting range: (00 to 05) or 32 00: Unused 01: RUN contactor output 02: Brake contactor output 03: Reserved 04: Lighting/Fan output 05: Reserved	32	-	★
F7-01	Y1 function selection		01	-	★
F7-02	Y2 function selection		02	-	★
F7-03	Y3 function selection		04	-	★
As an independent relay output, Y0 can be allocated any function among all the relay output functions. When emergency evacuation at power failure is required, only Y0 can be used as the relay for this output. F7-00 must be set to 32 so that the elevator can switch over to the emergency evacuation state after power failure. The functions that can be allocated to F1-01 to F7-03 are as follows: 00: Unused The terminal has no function. 01: RUN contactor output The terminal with this function controls whether the RUN contactor is opened or closed. 02: Brake contactor output The terminal with this function controls whether the brake contactor is opened or closed. 03: Higher-voltage startup of brake Every time the brake is released, the terminal retains the output for continuous 4s to control startup of the brake. 04: Lighting/Fan output It is used for the lighting/fan output. 05: Reserved					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F7: Terminal Output Parameters					
F7-04	Y4 function selection	Setting range: 06 to 99 00: Unused 06: Door 1 open output 07: Door 1 close output 08: Reserved 09: Reserved 10: Low 7-segment a display output 11: Low 7-segment b display output 12: Low 7-segment c display output 13: Low 7-segment d display output 14: Low 7-segment e display output 15: Low 7-segment f display output 16: Low 7-segment g display output 17: Up arrow display output 18: Down arrow display output 19: Minus sign display output 20: Returning to main floor at fire emergency 21: Buzzer output 22: Overload output 23: Arrival gong output 24: Full-load output 25: Inspection output 26: Fan output 27: Door lock circuit shorting contactor output 28: BCD/Gray code/7-segment high-bit output 29: Controller output during normal running 30: Electric lock output 31: Reserved 32: Emergency evacuation at power failure 33: Forced door close 1 34: Forced door close 2 35: Fault state 36: Up signal 37: Medical sterilization output 38: Non-door zone stop output 39: Non-service state output 40: Reserved 41: High 7-segment a display output 42: High 7-segment b display output 43: High 7-segment c display output 44: High 7-segment d display output 45: High 7-segment e display output 46: High 7-segment f display output 47: High 7-segment g display output 48: India ARD up running output 49: India ARD down running output 50: Up arrival indicator output 51: Down arrival indicator output 52: Up/Down arrival indicator output 53: Fire emergency state prompt output 54: Elevator output in normal mode 55: Manual door lock disconnection prompt 56: Attendant state prompt 57 to 99: Reserved	26	-	★
F7-05	Y5 function selection		06	-	★
F7-06	Y6 function selection		07	-	★
F7-07	Y7 function selection		48	-	★
F7-08	Y8 function selection		49	-	★
F7-09	Y9 function selection		25	-	★
F7-10	Y10 function selection		10	-	★
F7-11	Y11 function selection		11	-	★
F7-12	Y12 function selection		12	-	★
F7-13	Y13 function selection		13	-	★
F7-14	Y14 function selection		14	-	★
F7-15	Y15 function selection		15	-	★
F7-16	Y16 function selection		16	-	★
F7-17	Y17 function selection		17	-	★
F7-18	Y18 function selection		18	-	★
F7-19	Y19 function selection		19	-	★
F7-20	Y20 function selection		20	-	★
F7-21	Y21 function selection		21	-	★
F7-22	Y22 function selection		22	-	★
F7-23	Y23 function selection		23	-	★
F7-24	Y24 function selection		24	-	★

Group F8: Advanced Function Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F8: Advanced Function Parameters					
F8-05	Current car load	0–255	0	%	●
This parameter is read-only and indicates the load in the car. The controller does not use a load sensor. It estimates the current car load based on the current output during the stable running of the elevator.					
F8-06	Mechanical friction torque	0.0–100.0	10	%	★
When there is almost no rollback when the brake is released, this indicates that the mechanical system friction is large which may lead to an inaccurate judgment of load conditions at the zero-speed stage. You can set this parameter to enable the AC drive to judge the load status accurately when the elevator runs at a constant speed. To set this parameter, keep the car in no-load state, run the elevator in up direction and record the value of FA-22 during running at a constant speed. Then, run the elevator in the down direction and record the value of FA-22 during running at a constant speed. Calculate an average of the two recorded values and set F8-06 to this value. The AC drive will record the status of this signal upon power failure. After the power supply is recovered, the AC drive will output this signal according to the previously recorded status. Car load will be detected again during elevator running and this signal will be updated. You can view the load detected by the AC drive in F8-05.					
F8-09	Emergency evacuation speed at power failure	0.000 to F3-11	0.05	m/s	★
It is used to set the running speed for emergency evacuation at power failure.					
F8-10	Emergency evacuation power supply at power failure	0: Motor not running 1: Motor running powered by UPS 2: Motor running powered by 48 V battery	0	-	★
F8-11	Stop torque output delay	0.200–3.000	0.300	s	★
F8-12	Fire emergency floor 2	0 to F6-00	0	-	★
F8-13	Anti-nuisance function	Bit0: Reserved Bit1: Nuisance judged by light curtain Bit 2: Nuisance judged by light-load signal	0	-	★
It is used to set the criteria for judging whether a nuisance exists. Possible setting values are: Bit0: Anti-nuisance function disabled Bit1: 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. Bit2: Nuisance judged by light-load signal. If the light-load signal is active, the system determines that nuisance exists when the number of car calls is greater than 3. When the system determines that the elevator is in the nuisance state, it cancels all car calls. In this case, car calls need to be registered again.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F8: Advanced Function Parameters					
F8-14	Startup mode	0: DC injection braking startup 1: Pre-excitation startup (AC asynchronous motor)	0	-	★
F8-15	DC injection braking current at startup	0–150	0	%	★
F8-16	DC injection braking current at stop	0–150	30	%	★
F8-20	Delay of arrival at door zone in emergency evacuation	0.000–2.000	0	s	★

Group F9: Time Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group F9: Time Parameters					
F9-00	Idle time before returning to main floor	1–240 0: Disabled	10	min	☆
F9-01	Fan/Lighting turn-off time	0–6000 0: Disabled, indicating that the fan is always ON.	60	s	☆
F9-02	Motor running time limit	0–45 Invalid for the time less than 3s.	45	s	★
It is used to set the running time limit of the motor. If this parameter is set to a value smaller than 3s, it becomes invalid. In the normal running state, if the 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.					
F9-03	Accumulative running hours	0–65535	0	h	●
F9-05	High byte of running times	0–9999 Note: 1 indicates an actual number of 10,000 running cycles	0	-	●
F9-06	Low byte of running times	0–9999	0	-	●
F9-08	Set running time	0–9999	0	h	●
These parameters are used to view the actual running time and running times of the elevator. Number of running times = high byte of running times x 1000 + low byte of running times					

Group FA: Display Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					
FA-00	Baud rate	0: 9600 1: 38400	1	-	-
FA-01	Display in running state	1–65535	65535	-	☆

It is used to set the running parameters displayed on the operating panel when the elevator is in the running state.
A total of 16 running parameters can be displayed during running, with each respectively corresponding to the 16 binary bits of FA-01. You can switch over the displayed parameter by pressing the SHIFT key. Each parameter is controlled by a binary bit. If a bit is set to 1, the parameter indicated by this bit is displayed; if this bit is set to 0, the parameter is not displayed. You can set whether to display this parameter according to your own habit.
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	Reserved	1
Bit1	Rated elevator speed	1	Bit9	System state	1
Bit2	Bus voltage	1	Bit10	Reserved	1
Bit3	Output voltage	1	Bit11	Input terminal 1 state	1
Bit4	Output current	1	Bit12	Input terminal 2 state	1
Bit5	Output frequency	1	Bit13	Input terminal 3 state	1
Bit6	Current floor	1	Bit14	Output terminal 1 state	1
Bit7	Current position	1	Bit15	Output terminal 2 state	1

FA-02	Display in stop state	1–65535	65535	-	☆

It is used to set the parameters displayed on the operating panel when the elevator is in the stop state. A total of 16 parameters can be displayed at stop. The use is the same as that of FA-01.
The 16 binary bits correspond to the stop state parameters listed in the following table.

Bit	Parameter Name	Default	Bit	Parameter Name	Default
Bit0	Rated elevator speed	1	Bit8	Input terminal 2 state	1
Bit1	Bus voltage	1	Bit9	Input terminal 3 state	1
Bit2	Current floor	1	Bit10	Output terminal 1 state	1
Bit3	Current position	1	Bit11	Output terminal 2 state	1
Bit4	Car load	1	Bit12	Reserved	0
Bit5	Slow-down distance at rated speed	1	Bit13	Reserved	0
Bit6	System state	1	Bit14	Reserved	0
Bit7	Input terminal 1 state	1	Bit15	Reserved	0

The running and stop parameters of the controller are important references for engineers to perform commissioning on site. The parameters are described as follows:
Running speed: indicates the actual running speed of the elevator. Its maximum value is F0-03 (Maximum running speed), in a unit of m/s.
Set speed: indicates the set speed of the controller during elevator running. It is the running speed calculated by the system theoretically at which the elevator should run, in unit of m/s.
Bus voltage: indicates the DC bus voltage of the controller, in a unit of V.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					

Current floor: indicates the information of the physical floor where the elevator is located. It is the same as the value of F4-01.
Current position: indicates the absolute distance from the current elevator car to the leveling plate of the first floor, in a unit of m.
Car load: indicates the percentage of the car load to the rated load judged by the controller based on data from the sensor, in a unit of %.
Output voltage: indicates the effective value of the equivalent voltage of the PWM wave output by the controller, in a unit of V.
Output current: indicates the effective value of the actual current when the controller drives the motor to turn, in a unit of A.
Output frequency: indicates the actual frequency of the motor during running. It has a fixed corresponding relationship with the running speed. The unit is Hz.
Pre-torque current: indicates the percentage of the pre-torque current compensated during startup to the rated current, in a unit of %.
The following describes the details for I/O terminal state display.
Input terminal 1 state: indicate the meaning of input terminals by bit. "1" indicates that the signal is active. A total of 16 bits are defined as follows:

Bit	Description	Bit	Description
Bit0	Reserved	Bit8	Shorting door lock circuit output feedback
Bit1	Up leveling signal	Bit9	Inspection signal
Bit2	Down leveling signal	Bit10	Inspection up signal
Bit3	Door zone signal	Bit11	Inspection down signal
Bit4	RUN contactor feedback	Bit12	Fire emergency signal
Bit5	Brake contactor feedback	Bit13	Reserved
Bit6	Brake travel switch feedback	Bit14	Elevator lock signal
Bit7	Self-lock feedback	Bit15	Up limit signal

Input terminal 2 state: indicate the meaning of input terminals by bit. "1" indicates that the signal is active. A total of 16 bits are defined as follows:

Bit	Description	Bit	Description
Bit0	Down limit signal	Bit8	Door 1 close limit
Bit1	Up slow-down signal	Bit9	Reserved
Bit2	Down slow-down signal	Bit10	Door 1 light curtain
Bit3	Overload signal	Bit11	Reserved
Bit4	Full-load signal	Bit12	Attendant signal
Bit5	Emergency stop (safety feedback) signal	Bit13	Direct travel ride signal
Bit6	Door 1 open limit	Bit14	Direction change signal
Bit7	Reserved	Bit15	Independent running

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					

Input terminal 3 state: indicate the meaning of input terminals by bit. "1" indicates that the signal is active. A total of 16 bits are defined as follows:

Bit	Description	Bit	Description
Bit0	Reserved	Bit8	Motor overheating
Bit1	UPS input	Bit9	Door 1 safety edge
Bit2	Door open button	Bit10	Reserved
Bit3	Door close button	Bit11	Earthquake signal
Bit4	Safety circuit	Bit12	Reserved
Bit5	Door lock circuit 1	Bit13	Light-load
Bit6	Door lock circuit 2	Bit14	Reserved
Bit7	Half-load signal	Bit15	Fire emergency floor switchover

Output terminal 1 state: indicates the meaning of output terminals by bit. "1" indicates that the signal is active. A total of 16 bits are defined as follows:

Bit	Description	Bit	Description
Bit0	Reserved	Bit8	Door 2 open
Bit1	RUN contactor	Bit9	Door 2 close
Bit2	Brake contactor	Bit10	Low 7-segment a display output
Bit3	Higher-voltage startup of brake	Bit11	Low 7-segment b display output
Bit4	Fan/Lighting output	Bit12	Low 7-segment c display output
Bit5	Shorting PMSM stator output	Bit13	Low 7-segment d display output
Bit6	Door 1 open	Bit14	Low 7-segment e display output
Bit7	Door 1 close	Bit15	Low 7-segment f display output

Output terminal 2 state: indicates the meaning of output terminals by bit. "1" indicates that the signal is active. A total of 16 bits are defined as follows:

Bit	Description	Bit	Description
Bit0	Low 7-segment g display output	Bit8	Full-load output
Bit1	Up arrow display output	Bit9	Inspection output
Bit2	Down arrow display output	Bit10	Fan/Lighting output 2
Bit3	Minus sign display output	Bit11	Shorting door lock circuit contactor output
Bit4	Returning to main floor at fire emergency output	Bit12	BCD/Gray code/7-segment code high-byte output
Bit5	Buzzer output	Bit13	Controller normal running output
Bit6	Overload output	Bit14	Electric lock output
Bit7	Arrival gong output	Bit15	Reserved

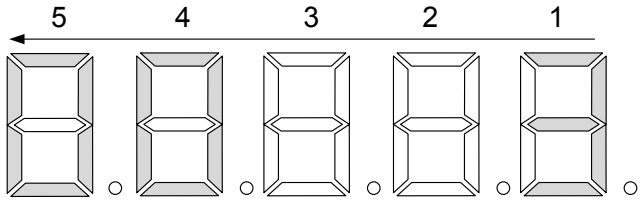
<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Setting Range</th><th>Default</th><th>Unit</th><th>Property</th></tr>
<tr><td colspan="6">FA: Display Parameters</td></tr>
<tr><td colspan="6">System state: indicates the system state by bit. "1" indicates that the signal is active. A total of 16 bits are defined as follows:
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>Bit0</td><td>Light curtain state 1</td><td>Bit8</td><td rowspan="4">Car state:
1: Door open
2: Door open holding
3: Door close
4: Door close limit
5: Running</td></tr>
<tr><td>Bit1</td><td>Light curtain state 2</td><td>Bit9</td></tr>
<tr><td>Bit2</td><td>Elevator lock signal</td><td>Bit10</td></tr>
<tr><td>Bit3</td><td>Fire emergency</td><td>Bit11</td></tr>
<tr><td>Bit4</td><td rowspan="4">Elevator state:
0: Inspection
1: Shaft auto-tuning
3: Returning to main floor at fire emergency
4: Firefighter operation
6: Attendant operation
7: Automatic (normal)</td><td>Bit12</td><td>Full-load</td></tr>
<tr><td>Bit5</td><td>Bit13</td><td>Overload</td></tr>
<tr><td>Bit6</td><td>Bit14</td><td>Reserved</td></tr>
<tr><td>Bit7</td><td>Bit15</td><td>Reserved</td></tr>
</table></td></tr>
<tr><td>FA-03</td><td>Current encoder angle</td><td>0.0–360.0</td><td>0.0</td><td>degree</td><td>●</td></tr>
<tr><td>FA-05</td><td>Software version (ZK)</td><td>0–65535</td><td>0</td><td>-</td><td>●</td></tr>
<tr><td>FA-06</td><td>Software version (DSP)</td><td>0–65535</td><td>0</td><td>-</td><td>●</td></tr>
<tr><td>FA-07</td><td>Heatsink temperature</td><td>0 to 100°C</td><td>0</td><td>°C</td><td>●</td></tr>
<tr><td>FA-12</td><td>Logic information</td><td>0–65535</td><td>0</td><td>-</td><td>-</td></tr>
<tr><td colspan="6">It displays the elevator state parameters.
The LEDs are numbered 5, 4, 3, 2, 1 from left to right. LED 1 shows the state of door 1. LEDs 2 and 3 have no display. LEDs 4 and 5 together show the elevator state. The following figure shows the elevator in inspection and door close state.
 

Figure 5-7 Elevator state display</td></tr>
</table>

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					

The LEDs are defined in the following table.

5		4		3	2	1	
Elevator state				No display	No display	Door 1 state	
00	Inspection state	8	Elevator lock	-	-	0	Waiting state
01	Shaft auto-tuning	09	Idle elevator parking			1	Door open state
02	Micro-leveling	10	Re-leveling at a low speed			2	Door open limit
03	Returning to main floor at fire emergency	11	Emergency evacuation operation			3	Door close state
04	Firefighter running	12	Motor auto-tuning			4	Door close limit
05	Fault state	13	Operating panel control			-	-
06	Attendant state	14	Main floor verification			-	-
07	Automatic state	-	-			-	-

FA-13	Curve information	0–65535	0	-	-

It displays the system running curve information. Similar to the display of FA-12, LEDs 5, 4 and 3 have no display, while LEDs 2 and 1 show the running curve information. The following table shows the details:

5	4	3	2		1	
No display	No display	No display	Curve information			
-	-	-	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 phase
			05	Acceleration start segment	14	Reserved
			06	Linear acceleration segment	15	Stop data processing
			07	Acceleration end segment	16 to 20	Auto-tuning stage
			08	Stable-speed running segment	21	Emergency running

FA-14	Set speed	0.000–4.000	0	m/s	●
FA-15	Feedback speed	0.000–4.000	0	m/s	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					
FA-16	Bus voltage	0–999.9	0	V	●
FA-17	Current position	0.0–300.0	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	0–200.0	0	%	●
FA-23	Output power	0.00–99.99	0	kW	●
FA-24	Communication interference	0–65535	0	-	●

The current communication quality of the system are also displayed by five LEDs, as described in the following table.

5		4	3		2	1
SPI communication quality		No display	CAN communication quality		No display	No display
0	High	-	0	High	-	-
↓	↑		↓	↑		
9	Interrupted		9	Interrupted		

Values 0 to 9 indicates the communication quality. The greater the number is, the larger interference the communication suffers and the lower the communication quality is.

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-29	Input state 4	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	-	●
FA-33	Output state 3	0–65535	0	-	●
FA-34	Floor I/O state 1	0–65535	0	-	●
FA-35	Floor I/O state 2	0–65535	0	-	●
FA-36	Floor I/O state 3	0–65535	0	-	●
FA-37	Floor I/O state 4	0–65535	0	-	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					

These parameters show the system I/O state. For details, see the following figure.

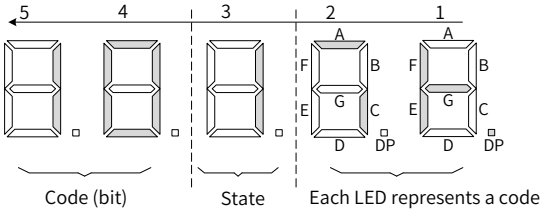


Figure 5-8 Example of the input state display

As shown in the preceding figure, the LEDs from right to left are numbered 1, 2, 3, 4, and 5. For FA-26 to FA-37, LEDs 5 and 4 show the code indicating the function, LED 3 shows whether this function is valid (1) or invalid (0), and the 16 segments of LEDs 1 and 2 show the states of the16 functions defined by this parameter.

The preceding figure shows a display of FA-16: LEDs 5, 4, and 3 show that function 10 (Inspection up) is 1 (Valid); LEDs 1 and 2 show that besides function 10, functions 4 (RUN contactor feedback), 5 (Brake contactor feedback), 6 (Brake travel switch feedback), 7 (Shorting motor stator contactor feedback) and 8 (Shorting door lock circuit feedback) are also valid.

FA-26: Input State 1				FA-27: Input State 2			
No.	Function	No.	Function	No.	Function	No.	Function
0	Reserved	8	Shorting door lock circuit feedback	0	Down limit signal	8	Door 1 close limit
1	Up leveling signal	9	Inspection signal	1	Up slow-down signal	9	Door 2 close limit
2	Down leveling signal	10	Inspection up	2	Down slow-down signal	10	Door 1 light curtain
3	Door zone signal	11	Inspection down	3	Overload signal	11	Door 2 light curtain
4	RUN contactor feedback	12	Fire emergency	4	Full-load signal	12	Attendant signal
5	Brake contactor feedback	13	Reserved	5	Emergency stop	13	Direct travel ride signal
6	Brake travel switch feedback	14	Elevator lock	6	Door 1 open limit	14	Direction change signal
7	Shorting motor stator contactor feedback	15	Up limit signal	7	Door 2 open limit	15	Independent running

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property

FA: Display Parameters

FA-28: Input State 3				FA-29: Input State 4			
No.	Function	No.	Function	No.	Function	No.	Function
0	Door 2 selection	8	Motor overheating	0	Dummy floor	8	Reserved
1	UPS input valid	9	Door 1 safety edge	1	Firefighter switch	9	Reserved
2	Door open button	10	Door 2 safety edge	2	Brake travel switch feedback 2	10	Reserved
3	Door close button	11	Earthquake signal	3	Reserved	11	Reserved
4	Safety circuit	12	Rear door forbidden	4	Reserved	12	Reserved
5	Door lock circuit 1	13	Light-load	5	Reserved	13	Reserved
6	Door lock circuit 2	14	Single/Double door selection	6	Reserved	14	Reserved
7	Half-load signal	15	Fire emergency floor switchover	7	Reserved	15	Reserved
FA-30: Input State 5					FA-31: Output State 1		
No.	Function	No.	Function	No.	Function	No.	Function
0	Reserved	8	Reserved	0	Reserved	8	Door 2 open
1	Higher-voltage safety circuit	9	Reserved	1	RUN contactor output	9	Door 2 close
2	Higher-voltage door lock circuit 1	10	Reserved	2	Brake contactor output	10	Low 7-segment a display output
3	Higher-voltage door lock circuit 2	11	Reserved	3	Higher-voltage startup of brake	11	Low 7-segment b display output
4	Reserved	12	Reserved	4	Fan/Lighting output	12	Low 7-segment c display output
5	Reserved	13	Reserved	5	Shorting motor stator contactor output	13	Low 7-segment d display output
6	Reserved	14	Reserved	6	Door 1 open	14	Low 7-segment e display output
7	Reserved	15	Reserved	7	Door 1 close	15	Low 7-segment f display output

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					

FA-32: Output State 2				FA-33: Output State 3			
No.	Function	No.	Function	No.	Function	No.	Function
0	Low 7-segment g display output	8	Full-load output	0	Emergency evacuation at power failure (valid).	8	Reserved
1	Up arrow display output	9	Inspection output	1	Forced door close 1	9	High 7-segment a display output
2	Down arrow display output	10	Fan/Lighting output 2	2	Forced door close 2	10	High 7-segment b display output
3	Minus sign display output	11	Shorting door lock circuit contactor output	3	Fault state	11	High 7-segment c display output
4	Returning to main floor at fire emergency	12	BCD/Gray code/7-segment code high-byte output	4	Up signal	12	High 7-segment d display output
5	Buzzer output	13	Controller normal running output	5	Medical sterilization output	13	High 7-segment e display output
6	Overload output	14	Electric lock output	6	Non-door zone stop output	14	High 7-segment f display output
7	Arrival gong output	15	Reserved	7	Non-service state output	15	High 7-segment g display output

The I/O signals of each floor are viewed in FA-34 to FA-40, as described in the following table.

FA-34: Floor I/O State 1				FA-35: Floor I/O State 2 (Door 1 Car Call)			
No.	Function	No.	Function	No.	Function	No.	Function
0	Door 1 open	8	Door 2 open	0	Floor 1 car call	8	Floor 9 car call
1	Door 1 close	9	Door 2 close	1	Floor 2 car call	9	Floor 10 car call
2	Door 1 open delay	10	Door 2 open delay	2	Floor 3 car call	10	Floor 11 car call
3	Door 2 selection	11	Reserved	3	Floor 4 car call	11	Floor 12 car call
4	Reserved	12	Reserved	4	Floor 5 car call	12	Floor 13 car call
5	Reserved	13	Reserved	5	Floor 6 car call	13	Floor 14 car call
6	Reserved	14	Reserved	6	Floor 7 car call	14	Floor 15 car call
7	Reserved	15	Reserved	7	Floor 8 car call	15	Floor 16 car call

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
FA: Display Parameters					

FA-36: Floor I/O State 3 (Door 1 Up Call)				FA-37: Floor I/O State 4 (Door 1 Down Call)			
No.	Function	No.	Function	No.	Function	No.	Function
0	Floor 1 up call	8	Floor 9 up call	0	Reserved	8	Floor 9 down call
1	Floor 2 up call	9	Floor 10 up call	1	Floor 2 down call	9	Floor 10 down call
2	Floor 3 up call	10	Floor 11 up call	2	Floor 3 down call	10	Floor 11 down call
3	Floor 4 up call	11	Floor 12 up call	3	Floor 4 down call	11	Floor 12 down call
4	Floor 5 up call	12	Floor 13 up call	4	Floor 5 down call	12	Floor 13 down call
5	Floor 6 up call	13	Floor 14 up call	5	Floor 6 down call	13	Floor 14 down call
6	Floor 7 up call	14	Floor 15 up call	6	Floor 7 down call	14	Floor 15 down call
7	Floor 8 up call	15	Reserved	7	Floor 8 down call	15	Floor 16 down call

FA-41	System state	0–65535 0: Display up direction # 1: Display down direction # 2: 1 = Running; 0 = Stop # 3: 1 = System full-load # 4: 1 = System overload # 5: 1 = System half-load # 6: 1 = System light-load #	0	-	●
FA-42	Input state 6	0–65535	0	-	●
FA-43	Input state 7	0–65535	0	-	●
FA-44	Non-standard version number	0–65535	0	-	●
FA-45	Manufacturer version number	0–65535	0	-	●
FA-46	Output state 4	0–65535	0	-	●
FA-47	Output state 5	0–65535	0	-	●

Group FB: Door Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FB: Door Parameters					
FB-00	Number of door operator(s)	1–2	1	-	★
FB-02	Service floors of door operator 1	0–65535 1: Normal door open 0: Door open forbidden	65535	-	☆
FB-03	Door open limit delay of manual door	1–60	5s	s	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FB: Door Parameters					
FB-05	Re-leveling stop delay	0.00–2.00	0	s	★
FB-06	Door open protection time	5–99	10	s	☆
FB-07	Program control selection	0–65535 Bit0 to Bit4: Reserved Bit5: Synchronous motor startup current detection Bit 6 to bit 12: Reserved Bit13: 1.5s detection of higher/lower voltage signal	0	-	☆

It is used to select the required program control functions. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. The following table describes the bits.

FB-07: Program Control Selection			
Bit	Function	Description	Default
Bit13	1.5s detection of higher/lower voltage signal	When the higher/lower voltage safety and door lock signals are set, the higher voltage and lower voltage signals must be consistent within 1.5s. Otherwise, the system considers that the signals are invalid. You need to power on the system again and then the system restores the detection.	0

FB-08	Door close protection time	5–99	15	s	☆
FB-09	Door open/close protection times	0–20 (0: Invalid)	0	-	☆
FB-10	Door state of standby elevator	0: Closing the door as normal at main floor 1: Waiting with door open at main floor 2: Waiting with door open at each floor	0	-	☆
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 upon open delay valid	10–1000	10	s	☆
FB-14	Door open holding time at main floor	1–1000	10	s	☆
FB-15	Arrival gong output delay	0–1000	0	ms	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FB: Door Parameters					
FB-16	Door lock waiting time at manual door	0–50	1	s	☆
FB-17	Holding time for forced door close	5–180	120	s	☆
FB-18	Door function selection	Bit0: India-specialized manual door Bit1: India-specialized semi-automatic door mode 1 Bit2: India-specialized semi-automatic door mode 2 Bit3: No door open/close limit Bit5: Arrival gong hall call prompt Bit6: 0: Continuous output of door lock verification prompts 1: Intermittent output of door lock verification prompts Bit7: 0: No buzzer output if the door lock is still disconnected after three times of verifications 1: The buzzer output continues if the door lock is still disconnected after three times of verifications	0	s	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FB: Door Parameters					

This parameter is used to select door functions. The following table describes the bits.

FB-18: Door Function Selection			
Bit	Function	Description	Default
Bit0	India-specialized manual door	Manual operation for both car doors and hall doors	0
Bit1	India-specialized semi-automatic door mode 1	Manual operation for hall doors, and automatic operation for car doors; Hall door lock is only effective when electromagnetic lock output is active. The electromagnetic lock is serial-connected to hall door lock circuit.	0
Bit2	India-specialized semi-automatic door mode 2	Manual operation for hall doors, and automatic operation for car doors; Hall door lock is effective when the hall doors are manually closed in place, without the need of closed electromagnetic lock. Additional electromagnetic lock feedback is needed in this case.	0
Bit3	No door open/close limit	Door open/close limit is regarded as reached when the door open/close lasts for 3s.	0
Bit5	Arrival gong hall call prompt	0: For up/down arrival gong, when the elevator arrives at the floor, a prompt is given without the need of a hall call. 1: For up/down arrival gong, when the elevator arrives at the floor, a prompt is given only when a hall call is registered.	0
Bit6	Door lock verification prompt output	0: Continuous output of door lock verification prompts 1: Intermittent output of door lock verification prompts	0
Bit7	Whether buzzer output continues after three times of door lock verifications for manual doors	0: No buzzer output if the door lock is still disconnected after three times of verifications. 1: The buzzer output continues if the door lock is still disconnected after three times of verifications.	0

FB-19	Holding time for electromagnetic lock close	1–60	3	s	☆
FB-20	Holding time for electromagnetic lock release	1–60	3	s	☆
FB-21	Holding time for electromagnetic lock feedback	0–65535	500	ms	★
FB-22	Re-leveling time limit for emergency evacuation	0–60000	180	s	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FB: Door Parameters					
FB-23	Door open holding time after emergency evacuation is completed	0–1000	5	s	☆

Group FC: Protection Function Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FC: Protection Function Parameters					
FC-00	Short circuit to ground detection at power-on	0–65535 Bit0: Short-circuit to ground detection at power-on enabled Bit1: Startup current detection canceled during inspection Bit2: Decelerating to stop at valid light curtain Bit3: Password protection ineffective in the case of no key operation within 30 min Bit4: Floor number is not cleared if the door lock is disconnected during running, and the elevator continues to run after door lock is connected again Bit5 to Bit9: Reserved	18	-	★
This parameter is used for program control function selection. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. The following table describes the bits.					

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FC: Protection Function Parameters					

FC-00: Program Control Function Selection 1			
Bit	Function	Description	Default
Bit0	Short circuit to ground detection at power-on	It is used to detect whether the motor is short-circuited to ground at power-on. If the motor is short-circuited to ground, the controller blocks the output immediately and reports the fault.	0
Bit1	Startup current detection canceled during inspection	You can cancel the limit on the maximum current at startup during inspection.	0
Bit2	Decelerating to stop at valid light curtain	During running at normal speed, the elevator decelerates to stop immediately after the light curtain acts and runs to the registered destination floor after the light curtain restores. This function is mainly used for manual doors.	0
Bit3	Password protection ineffective in the case of no key operation within 30 min	If you do not press any key 30 min after entering the password, the operating panel exits the parameter interface automatically. You need to enter the password again to enter the parameter interface.	0
Bit4	Floor number is not cleared if the door lock is disconnected during running	If the door lock is disconnected during running, door lock verification will be performed.	1

FC-01	Overload protection selection	0–65535 Bit0: Overload protection 0: Disabled; 1: Enabled Bit1: Output phase loss protection canceled. Bit2: Output phase loss protection mode 0: Only detection during running 1: Detection before startup and during running Bit3: Reserved Bit4: Light curtain judgment at door close limit 0: No re-open 1: Re-open Bit5: SPI communication detection disabled Bit7: Reserved Bit8: Reserved Bit9: Canceling Err55 alarm when the elevator stops at another floor Bit 10 to Bit 13: Reserved Bit14: Input phase loss protection canceled	69	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FC: Protection Function Parameters					

It is used for program control function selection. If a bit is set to 1, the function indicated by this bit is enabled; if this bit is set to 0, the function is disabled. The following table describes the bits.

FC-01: Program Control Function Selection 2

Bit	Function	Description	Default
Bit0	Overload protection	It sets whether to implement overload protection.	1
Bit1	Output phase loss protection disabled	It indicates that output phase loss protection is canceled.	0
Bit2	Output phase loss protection mode	0: Only detection during running 1: Detection before startup and during running	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	SPI communication detection disabled	It indicates that wire-breaking detection on SPI communication between the MCB and the drive board is disabled.	0
Bit9	Canceling Err55 alarm	When the door open limit signal upon arrival becomes inactive, the elevator stops at another floor and the system does not report fault Err55.	0
Bit14	Input phase loss protection canceled	It indicates that input phase loss protection is canceled.	0

FC-02	Overload protection coefficient	0.20–10.00	1.00	-	★
FC-03	Overload pre-warning coefficient	50–100	80	%	★
FC-04	Underload detection level	0.0–100.0	10.0	%	●
FC-05	Underload detection time	0.0–60.0	1.0	-	●

When the output current of the AC drive is less than the value set in FC-04 (Underload detection level), If underload protection function is effective and the underload lasts for longer than the time set in FC-05 (Underload detection time), the output frequency of the AC drive will decrease to 7% of the rated frequency automatically. During underload protection period, if the load is recovered, the AC drive will recover to its rated frequency automatically.

Parameters FC-17 to FC-46 record the latest 10 to 20 faults of the elevator. If the 10 detailed fault records are full, the earliest detailed fault record will be moved to the latest brief fault record. For example, if a new fault occurs, the fault code, subcode and time information of the fault recorded in group E9 (fault information) will be moved to FC-17 to FC-19. The brief fault record is a 4-digit number. The two high digits indicate the floor where the car is located when the fault occurs, and the two low digits indicate the fault code. For example, the 1st fault record is 0835, indicating that when the latest brief fault (fault Err35) occurs, the car is near floor 8. The fault subcode is used to locate the causes of the fault.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FC: Protection Function Parameters					
FC-17	11th fault code	0–9999 The two high digits indicate the floor number, and the two low digits indicate the fault code. For example, if Err30 (Elevator position abnormal) occurs on floor 1, the fault record will be 1030. 0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent during constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage during constant speed 8: Reserved 9: Undervoltage 10: AC drive overload 11: Motor overload 12: Power supply phase loss 13: Power output phase loss 14: Heatsink overheating 15: Power output abnormal 16: Encoder fault 17: Base signal fault 18: Current detection fault 19: Motor auto-tuning fault 20: Rotary encoder fault 21: Reserved 22: Leveling signal abnormal 23: Reserved 24: Reserved 25: Data storage abnormal 26: Earthquake signal 27 to 28 Reserved 29: Shorting PMSM stator contactor feedback abnormal 30: Elevator position abnormal 33: Elevator speed abnormal 34: Logic abnormal 35: Shaft auto-tuning data abnormal 36: RUN contactor feedback abnormal 37: Brake contactor feedback abnormal 38: Control rotary encoder signal abnormal	0	-	●
FC-18	11th fault subcode		0	-	●
FC-19	11th fault time		0	-	●
FC-20	12th fault code		0	-	●
FC-21	12th fault subcode		0	-	●
FC-22	12th fault time		0	-	●
FC-23	13th fault code		0	-	●
FC-24	13th fault subcode		0	-	●
FC-25	13th fault time		0	-	●
FC-26	14th fault code		0	-	●
FC-27	14th fault subcode		0	-	●
FC-28	14th fault time		0	-	●
FC-29	15th fault code		0	-	●
FC-30	15th fault subcode		0	-	●
FC-31	15th fault time		0	-	●
FC-32	16th fault code		0	-	●
FC-33	16th fault subcode		0	-	●
FC-34	16th fault time		0	-	●
FC-35	17th fault code		0	-	●
FC-36	17th fault subcode		0	-	●
FC-37	17th fault time		0	-	●
FC-38	18th fault code		0	-	●
FC-39	18th fault subcode		0	-	●
FC-40	18th fault time		0	-	●
FC-41	19th fault code		0	-	●
FC-42	19th fault subcode		0	-	●
FC-43	19th fault time		0	-	●
FC-44	20th fault code		0	-	●
FC-45	20th fault subcode		0	-	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FC: Protection Function Parameters					
FC-46	20th fault time	40: Elevator running time-out 41: Safety circuit disconnected 42: Door lock disconnected during running 43: Up limit signal inactive during running 44: Down limit signal inactive during running 45: Up/Down slow-down switch inactive 46: Re-leveling abnormal 47: Shorting door lock circuit contactor stuck 48: Door open fault 49: Door close fault 50: Continuous leveling signal loss 53: Door lock short-circuit fault 54: Startup overcurrent during inspection 55: Stop at another floor fault 57: SPI communication fault 58: Shaft position switch abnormal 62: Analog signal loss	0	-	●

Group FD: Communication Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FD: Communication Parameters					
FD-00	Controller address	0–127	1	-	★
FD-01	Response delay	0–20	10	ms	★
FD-02	Communication timeout	0–60.0	0	s	★
These RS232 serial port communication parameters are used for communication between the controller and the monitoring software in the host computer. FD-00 specifies the current address of the controller. The setting of this parameter must be consistent with the setting of the serial port parameters on the host computer so that the communication can be performed normally. FD-01 specifies the delay for the controller to send data through the serial port. FD-02 specifies the communication timeout of the serial port. Transmission of each frame must be completed within the time set in this parameter; otherwise, a communication fault occurs.					

Group FE: Elevator Function Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FE: Elevator Function Parameters					
FE-00	Collective selective mode	0: Full collective selective 1: Down collective selective 2: Up collective selective	0	-	★
FE-01	Floor 1 display	0000–1999 The two high digits indicate the display code of tens position, and the two low digits indicate the display code of ones position. The display of each code is as follows: 00: Display "0" 01: Display "1" 02: Display "2" 03: Display "3" 04: Display "4" 05: Display "5" 06: Display "6" 07: Display "7" 08: Display "8" 09: Display "9" 10: Display "A" 11: Display "B" 12: Display "G" 13: Display "H" 14: Display "L" 15: Reserved 16: Display "P" 17: Reserved 18: Display "-" 19: No display 23: Display "C" 24: Display "d" 25: Display "E" 26: Display "F" 28: Display "J" 31: Display "o" 35: Display "U" Greater than 35: No display	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	-	☆
FE-11	Floor 11 display		0101	-	☆
FE-12	Hall call output selection	0: 7-segment code 1: BCD code 2: Gray code 3: Binary code 4: One-to-one output	1	-	☆

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FE: Elevator Function Parameters					
FE-13	Elevator factory function setting selection 1	0–65535 If a bit is set to 1, the function indicated by this bit is enabled: Bit0: Reserved Bit1: Reserved Bit2: Reserved Bit3: Reserved Bit4: Reserved Bit5: Forced door close Bit6: Door open valid at non-door zone in the inspection state Bit7: Door open and close once after inspection turned to normal Bit8: Reserved Bit9: Independent running Bit10: Reserved Bit11: Door re-open after car call of the present floor Bit 12 to Bit 15: Reserved	0	-	☆
FE-14	Elevator factory function setting selection 2	0–65535 If a bit is set to 1, the function indicated by this bit is enabled: Bit0: Reserved Bit1: Door open holding upon door open limit Bit2: Door close command not output upon door close limit Bit3: Manual door function selection Bit4: Auto reset for RUN and brake contactors stuck Bit5: Slow-down switch stuck detection Bit 6 to Bit 9: Reserved Bit10: NC output of shorting motor stator contactor Bit11: Reserved Bit12: NC output of lighting/fan Bit 13 to Bit 15: Reserved	0	-	☆
FE-15	Floor 12 display	Floor display settings are the same as parameters FE-01 to FE-11	0102	-	☆

Group Fr: Leveling Adjustment Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group Fr: Leveling Adjustment Parameters					
Fr -00	Leveling adjustment mode	0–1	0	-	★
Fr -01	Leveling adjustment record 1	0–15015	0	-	★

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group Fr: Leveling Adjustment Parameters					
Fr -02	Leveling adjustment record 2	0–15015	0	-	★
Fr -03	Leveling adjustment record 3	0–15015	0	-	★
Fr -04	Leveling adjustment record 4	0–15015	0	-	★
Fr -05	Leveling adjustment record 5	0–15015	0	-	★
Fr -06	Leveling adjustment record 6	0–15015	0	-	★
Fr -07	Leveling adjustment record 7	0–15015	0	-	★
Fr -08	Leveling adjustment record 8	0–15015	0	-	★
Fr -09	Leveling adjustment record 9	0–15015	0	-	★
Fr -10	Leveling adjustment record 10	0–15015	0	-	★
Fr -11	Leveling adjustment record 11	0–15015	0	-	★
Fr -12	Leveling adjustment record 12	0–15015	0	-	★

These parameters are used to record the leveling adjustment values for each floor. Each parameter records the adjustment information on two floors. A total of 12 floor adjustment records are supported. The method of viewing the record is shown in the following figure.

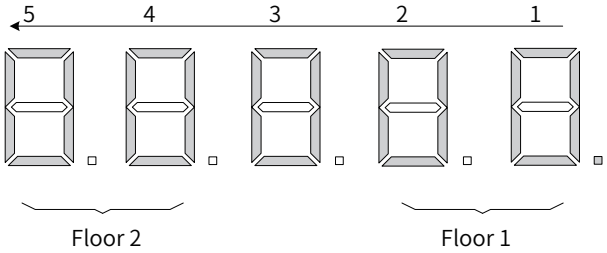


Figure 5-9 Description of leveling adjustment record

Perform the leveling adjustment as follows:

- Ensure that shaft auto-tuning is completed successfully, and the elevator runs properly at normal speed.
- Set Fr-00 to 1 to enable the car leveling adjustment function. The elevator inhibits hall calls, automatically runs to the top floor, and keeps the door open after arrival. If the elevator is on the top floor, it directly keeps the door open.
- Go into the car, press the top floor button, and the leveling time increases by 1 0.1s; press the bottom floor button, and the leveling time decreases by 0.1s. The value is displayed in the car. The positive value is displayed as "up arrow + value", with an adjustment range of 0 to 1.5s.
- After completing the adjustment for the current floor, press the top floor button and bottom floor button in the car simultaneously to save the adjustment result. The car display restores to the normal state. If the leveling position of the current floor need not be adjusted, press the top floor button and bottom floor button in the car simultaneously to exit the leveling adjustment state. Otherwise, car calls cannot be registered.
- 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.
- After completing the adjustment for all floors, set Fr-00 to 0 to disable the leveling adjustment function. Otherwise, the elevator cannot be used.

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group Fr: Leveling Adjustment Parameters					
Note: 1) When installing leveling switches for each floor, make sure that the position of the leveling switch is in the middle of leveling plates when the car door and the hall door are at the same level. 2) Perform leveling adjustment after riding comfort adjustment is completed.					

Group FP: User Parameters

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group FP: User parameters					
FP-00	User password	0–65535 0: No password	0	-	☆
FP-01	Parameter update	0: No update 1: Restore factory settings 2: Clear recorded information	0	-	★
FP-02	User-defined parameter display	0: Disabled 1: Enabled	0	-	★

Group E0: Details of 1st Fault

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group E0: Details of 1st Fault					
E0-00	1st fault code	0–9999	0	-	●
E0-01	1st fault subcode	0–65535	0	-	●
E0-02	1st fault time	0–65535	0	-	●
E0-03	Logic information of 1st fault	0–65535	0	-	●
E0-04	Curve information of 1st fault	0–65535	0	-	●
E0-05	Speed reference of 1st fault	0.000–65.535	0	m/s	●
E0-06	Feedback speed of 1st fault	0.000–65.535	0	m/s	●
E0-07	Bus voltage of 1st fault	0–999.9	0	V	●
E0-08	Present position of 1st fault	0.0–300.0	0	m	●
E0-09	Output current of 1st fault	0.0–999.9	0	A	●
E0-10	Output frequency of 1st fault	0.00–99.99	0	Hz	●
E0-11	Torque current of 1st fault	0.0–999.9	0	A	●
E0-12	Input state 1 of 1st fault	0–65535	0	-	●
E0-13	Input state 2 of 1st fault	0–65535	0	-	●
E0-14	Input state 3 of 1st fault	0–65535	0	-	●
E0-15	Input state 4 of 1st fault	0–65535	0	-	●

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
E0-16	Input state 5 of 1st fault	0–65535	0	-	●
E0-17	Input state 6 of 1st fault	0–65535	0	-	●
E0-18	Input state 7 of 1st fault	0–65535	0	-	●
E0-19	Output state 1 of 1st fault	0–65535	0	-	●
E0-20	Output state 2 of 1st fault	0–65535	0	-	●
E0-21	Output state 3 of 1st fault	0–65535	0	-	●
E0-22	Output state 4 of 1st fault	0–65535	0	-	●
E0-23	Output state 5 of 1st fault	0–65535	0	-	●

Group E9: Details of 10th Fault

Parameter No.	Parameter Name	Setting Range	Default	Unit	Property
Group E9: Details of 10th Fault					
E9-00	10th fault code	0–9999	0	-	●
E9-01	10th fault subcode	0–65535	0	-	●
E9-02	10th fault time	0–65535	0	-	●
E9-03	Logic information of 10th fault	0–65535	0	-	●
E9-04	Curve information of 10th fault	0–65535	0	-	●
E9-05	Speed reference of 10th fault	0.000–65.535	0	m/s	●
E9-06	Feedback speed of 10th fault	0.000–65.535	0	m/s	●
E9-07	Bus voltage of 10th fault	0–999.9	0	V	●
E9-08	Present position of 10th fault	0.0–300.0	0	m	●
E9-09	Output current of 10th fault	0.0–999.9	0	A	●
E9-10	Output frequency of 10th fault	0.00–99.99	0	Hz	●
E9-11	Torque current of 10th fault	0.0–999.9	0	A	●
E9-12	Input state 1 of 10th fault	0–65535	0	-	●
E9-13	Input state 2 of 10th fault	0–65535	0	-	●
E9-14	Input state 3 of 10th fault	0–65535	0	-	●
E9-15	Input state 4 of 10th fault	0–65535	0	-	●
E9-16	Input state 5 of 10th fault	0–65535	0	-	●
E9-17	Input state 6 of 10th fault	0–65535	0	-	●
E9-18	Input state 7 of 10th fault	0–65535	0	-	●
E9-19	Output state 1 of 10th fault	0–65535	0	-	●
E9-20	Output state 2 of 10th fault	0–65535	0	-	●
E9-21	Output state 3 of 10th fault	0–65535	0	-	●
E9-22	Output state 4 of 10th fault	0–65535	0	-	●
E9-23	Output state 5 of 10th fault	0–65535	0	-	●

6 Troubleshooting

6.1 Description of Fault Levels

The controller has almost 70 pieces of alarm information and protective functions. It monitors various input signals, running conditions and feedback signals in real time. 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 6-2 Description of fault levels

Fault Level	Fault State	Remarks
Level 1	◆ Display the fault code. ◆ Output the fault relay action command.	1A–The elevator running is not affected on any condition.
Level 2	◆ Display the fault code. ◆ Output the fault relay action command. ◆ Continue normal running of the elevator.	2A–The parallel/group control l function is disabled.
		2B–The advance door opening/re-leveling function is disabled.
Level 3	◆ Display the fault code. ◆ Output the fault relay action command. ◆ Stop output and apply the brake immediately after stop.	3A–In low-speed running, the elevator stops at special deceleration rate and cannot restart.
		3B–In low-speed running, the elevator does not stop. In running at normal speed, the elevator stops and can starts running at low speed after a delay of 3s.
Level 4	◆ Display the fault code. ◆ Output the fault relay action command. ◆ In distance control, the elevator decelerates to stop and cannot run again.	4A–In low-speed running, the elevator stops at special deceleration rate and cannot restart.
		4B–In low-speed running, the elevator does not stop. In running at normal speed, the elevator stops and can start running at low speed after a delay of 3s.
		4C–In low-speed running, the elevator does not stop. In running at normal speed, the elevator stops and can start running at low speed after a delay of 3s.
Level 5	◆ Display the fault code. ◆ Output the fault relay action command. ◆ The elevator stops immediately.	5A–In low-speed running, the elevator stops immediately and cannot restart.
		5B–In low-speed running, the elevator does not stop. In running at normal speed, the elevator stops and can start running at low speed after a delay of 3s.

6.2 Fault Information and Troubleshooting

If an alarm is reported, the system performs corresponding processing based on the fault level. You can handle the fault according to the possible causes described in the following table.

Fault Code	Fault Description	Possible Cause	Solution	Level
Err02	Overcurrent during acceleration	◆ The main circuit output is grounded or short circuited. ◆ Motor auto-tuning is performed improperly. ◆ The load is too heavy. ◆ The encoder signal is incorrect. ◆ The UPS feedback signal is abnormal.	◆ Check whether the RUN contactor at the controller output side is normal. ◆ Check whether the power cable jacket is damaged or possibly short circuited to ground, and whether the power cable is connected reliably. ◆ Check the insulation of motor power terminals, and check whether the motor winding is short-circuited or grounded. ◆ Check whether shorting PMSM stator contactor causes controller output short circuit. ◆ Check whether motor parameters comply with the nameplate. ◆ Perform motor auto-tuning again. ◆ Check whether the brake keeps released before the fault occurs and whether the brake is stuck mechanically. ◆ Check whether the balance coefficient is correct. ◆ Check whether the encoder wirings are correct. For asynchronous motor, perform SVC and compare the current to judge whether the encoder works properly. ◆ Check whether encoder pulses per revolution (PPR) is set correctly, whether the encoder signal is interfered, 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, and whether the encoder is stable during high-speed running. ◆ Check whether UPS feedback is valid in the non-UPS running state (Err02). ◆ Check whether the acceleration/ deceleration rate is too high. (Err02, Err03)	5A
Err03	Overcurrent during deceleration	◆ The main circuit output is grounded or short-circuited. ◆ Motor auto-tuning is performed improperly. ◆ The load is too heavy. ◆ The deceleration rate is too short. ◆ The encoder signal is incorrect.		5A
Err04	Overcurrent at a constant speed	◆ The main circuit output is grounded or short circuited. ◆ Motor auto-tuning is performed improperly. ◆ The load is too heavy. ◆ The encoder is seriously interfered.		5A

Fault Code	Fault Description	Possible Cause	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 is abnormal. ◆ The acceleration rate is too short.	◆ Adjust the input voltage. Observe whether the bus voltage is normal and whether it rises too quickly during running. ◆ Check whether the balance coefficient is correct. ◆ Select a proper braking resistor and check whether the resistance is too large based on the recommended braking resistance. ◆ Check whether the cable connecting the braking resistor is damaged, whether the copper wire touches the ground, and whether the connection is secure.	5A
Err06	Overvoltage during deceleration	◆ The input voltage is too high. ◆ The braking resistance is too large, or the braking unit is abnormal. ◆ The deceleration rate is too short.		5A
Err07	Overvoltage at a constant speed	◆ The input voltage is too high. ◆ The braking resistance is too large, or the braking unit is abnormal.		5A
Err09	Undervoltage	◆ Instantaneous power failure occurs on the input power supply. ◆ The input voltage is too low. ◆ The drive control board fails.	◆ Eliminate external power supply faults and check whether the power fails during running. ◆ Check whether the wiring of all power input cables is secure. ◆ Contact the agent or Inovance.	5A
Err10	Drive overload	◆ The brake circuit is abnormal. ◆ The load is too heavy. ◆ The encoder feedback signal is abnormal. ◆ The motor parameters are incorrect. ◆ The motor power cables are connected incorrectly.	◆ Check the brake circuit and power input. ◆ Reduce the load. ◆ Check whether the encoder feedback signal and 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. ◆ Check power cables of the motor. (See the solution of Err02)	4A
Err11	Motor overload	◆ FC-02 is set improperly. ◆ The brake circuit is abnormal. ◆ The load is too heavy.	◆ Adjust the parameter (FC-02 can be set to the default value). ◆ See the solution of Err10.	3A

Fault Code	Fault Description	Possible Cause	Solution	Level
Err12	Phase loss on the input side	◆ The power input phases are not symmetric. ◆ The drive control board is abnormal.	◆ Check whether the three phases on the input side are balanced and whether the power voltage is normal. If not, adjust the power input. ◆ Contact the agent or Inovance.	4A
Err13	Phase loss on the output side	◆ The output wiring of the main circuit is loose. ◆ The motor is damaged.	◆ Check the wiring. ◆ Check whether the contactor on the output side is normal. ◆ Eliminate the motor fault.	4A
Err14	IGBT overheating	◆ The ambient temperature is too high. ◆ The fan is damaged. ◆ The air filter is blocked.	◆ Lower the ambient temperature. ◆ Clear the air filter. ◆ Replace the damaged fan. ◆ Check whether the installation clearance of the controller satisfies the requirement.	5A
Err15	Power output abnormal	◆ Braking short-circuit occurs on the output side. ◆ The UVW output is abnormal.	◆ Check whether the wiring of the braking resistor and braking unit is correct. Ensure that there is no short-circuit. ◆ Check whether the main contactor works properly. ◆ Contact the agent or Inovance.	5A
Err16	Current control fault	◆ The excitation current deviation is too large. ◆ The torque current deviation is too large. ◆ The time of exceeding torque upper limit is too long.	◆ Check the circuit of the encoder. ◆ The output air switch becomes OFF. ◆ The values of the current loop parameters are too small. ◆ Perform motor auto-tuning again if the zero-point position is incorrect. ◆ Reduce the load if it is too heavy.	5A
Err18	Current detection fault	◆ The drive control board fails.	◆ Contact the agent or Inovance.	5A
Err19	Motor auto-tuning fault	◆ The motor cannot rotate properly. ◆ The motor auto-tuning times out. ◆ The rotary encoder of the PMSM is abnormal.	◆ Enter the motor parameters correctly. ◆ Check the motor wiring and whether phase loss occurs on the contactor at the output side. ◆ Check the encoder wiring and ensure that the encoder PPR is set properly. ◆ Check whether the brake keeps released during no-load auto-tuning. ◆ Check whether the inspection button is released before the PMSM with-load auto-tuning is completed.	5A

Fault Code	Fault Description	Possible Cause	Solution	Level
Err22	Leveling signal abnormal	◆ 101: The leveling signal is active during floor switchover. ◆ 102: The falling edge of the leveling signal is not detected during elevator startup and floor switchover. ◆ 103: The leveling position deviation is too large during normal elevator running.	◆ 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. ◆ 103: Check whether the steel rope slips.	1A
Err25	Data storage abnormal	◆ 101, 102: The storage data of the MCB is abnormal.	◆ 101, 102: Contact the agent or Inovance.	4A
Err26	Earthquake signal	◆ 101: The earthquake signal is active and the duration exceeds 2s.	◆ 101: Check whether the earthquake signal is consistent with the parameter setting (NC, NO) of the MCB.	3B
Err30	Elevator position abnormal	◆ 101, 102: In the normal-speed running or re-leveling running mode, the running time is larger than the value of F9-02, but the leveling signal has no change.	◆ 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, causing too long re-leveling running time; Check whether signal loss exists in the encoder circuits.	4A
Err34	Logic fault	◆ Logic of the MCB is abnormal.	◆ Contact the agent or Inovance to replace the MCB.	5A

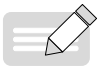
Fault Code	Fault Description	Possible Cause	Solution	Level
Err35	Shaft auto-tuning data abnormal	◆ 101: When shaft auto-tuning starts, the elevator is not at the bottom floor or the down slow-down is invalid. ◆ 102: The inspection switch becomes OFF during shaft auto-tuning. ◆ 103: It is judged upon power-on that shaft auto-tuning is not performed. ◆ 104: In distance control mode, it is judged at running startup that shaft auto-tuning is not performed. ◆ 106, 107, 109, 114: The plate pulse length sensed at up/down leveling is abnormal. ◆ 108, 110: The leveling signal has no change for 45s during auto-tuning. ◆ 111, 115: The stored floor height is smaller than 50 cm. ◆ 112: The floor when auto-tuning is completed is not the top floor. ◆ 113: The pulse check is abnormal.	◆ 101: Check whether the down slow-down switch is valid, and whether the current floor is the bottom floor. ◆ 102: Check whether the inspection switch is in inspection state. ◆ 103, 104: Perform shaft auto-tuning. ◆ 106, 107, 109, 114: Check whether the signal feature (NO/NC) of leveling sensors are 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. ◆ 108, 110: Check whether the running times out: No leveling signal is received when the motor running time exceeds F9-02. ◆ 111, 115: Enable the super short floor function if the floor distance is less than 50 cm. If the floor distance is normal, check the installation of the leveling plate for this floor or check the sensor. ◆ 112: Check whether the setting of F6-00 (Top floor of the elevator) is smaller than the actual condition. ◆ 113: Check whether the signal of the leveling sensor is normal. Perform shaft auto-tuning again.	4C

Fault Code	Fault Description	Possible Cause	Solution	Level
Err36	RUN contactor feedback abnormal	◆ 101: The RUN contactor has no output, but the RUN contactor feedback is active. ◆ 102: The RUN contactor has an output, but the RUN contactor feedback is inactive. ◆ 103: The startup current of the asynchronous motor is too small. ◆ 104: When both feedback signals of the RUN contactor are enabled, their states are inconsistent.	◆ 101, 102, 104: Check whether the feedback contact of the contactor acts properly and whether the signal feature of the feedback contact is NO or NC. ◆ 103: Check whether the output cables UVW of the controller are connected properly and whether the control circuit of the RUN contactor coil is normal.	5A
Err37	Brake contactor feedback abnormal	◆ 101: The output of the brake contactor is inconsistent with the feedback. ◆ 102: When both feedback signals of the brake contactor are enabled, their states are inconsistent. ◆ 103: The output of the brake contactor is inconsistent with the feedback 2. ◆ 104: When both feedback 2 signals of the brake contactor are enabled, their states are inconsistent.	◆ 101 to 104: Check whether the brake coil and feedback contact are correct, whether the signal feature of the feedback contact is NO or NC, and whether the control circuit of the brake contactor coil is normal.	5A
Err39	Motor overheating	◆ 101: The motor overheating relay input remains valid for a certain time.	◆ 101: Check whether the thermal protection relay is normal and whether the motor is used properly and damaged. Improve the cooling conditions of the motor.	3A
Err40	Elevator running time-out	◆ Elevator running time-out	◆ Check the related parameter, or contact the agent or Inovance.	4B

Fault Code	Fault Description	Possible Cause	Solution	Level
Err41	Safety circuit disconnected	◆ 101: The safety circuit signal becomes inactive.	◆ 101: Check the safety circuit switches and their states. ◆ Check whether the external power supply is normal, whether the safety circuit contactor acts properly, and whether the signal feature of the feedback contact of the safety circuit contactor is NO or NC.	5A
Err42	Door lock disconnected during running	◆ 101: The door lock circuit feedback is invalid during the elevator running. ◆ 105: The door lock is disconnected immediately (SAFE signal is invalid during running)	◆ 101: Check whether the hall door lock and the car door lock are in good contact, whether the door lock contactor acts properly, whether the signal feature of the feedback contact on the door lock contactor is NO or NC, and whether the external power supply is normal. ◆ 105: Check whether the hall door lock and the car door lock are in good contact and connected reliably, and whether the hardware circuit giving SAFE signal is normal.	5A
Err43	Up limit signal abnormal	◆ 101: The up limit switch acts when the elevator is running in up direction.	◆ 101: Check the feature (NO, NC) of the up limit signal. ◆ Check whether the up limit switch is in good contact. When the limit switch is installed at a relatively low position, it will act when the elevator arrives at the terminal floor during normal running.	4C
Err44	Down limit signal abnormal	◆ 101: The down limit switch acts when the elevator is running in down direction.	◆ 101: Check the feature (NO, NC) of the down limit signal. ◆ Check whether the down limit switch is in good contact. When the limit switch is installed at a relatively high position, it will act when the elevator arrives at the terminal floor during normal running.	4C

Fault Code	Fault Description	Possible Cause	Solution	Level
Err45	Slow-down switch abnormal	◆ 101: The down slow-down distance is insufficient during shaft auto-tuning. ◆ 102: The up slow-down distance is insufficient during shaft auto-tuning. ◆ 103: The slow-down position is abnormal during normal running. ◆ 104, 105: The elevator speed exceeds the maximum speed when slow-down is enabled.	◆ 101 to 103: Check whether the up slow-down switch and down slow-down switch are in good contact, and check the feature (NO, NC) of the up slow-down signal and down slow-down signal. ◆ 104, 105: Ensure that the installation distance of slow-down switches satisfies the slow-down requirement at present elevator speed.	4B
Err48	Door open fault	◆ 101: The consecutive times that the door does not open to the limit reaches the setting in FB-13.	◆ 101: Check whether the door operator system works properly, whether the CTB is normal, and whether the door open limit signal is normal.	5A
Err49	Door close fault	◆ 101: The consecutive times that the door does not close to the limit reaches the setting in FB-13.	◆ 101: Check whether the door operator system works properly, whether the CTB is normal, and whether the door lock acts properly.	5A
Err50	Continuous leveling signal loss	◆ Leveling signal stuck or loss occurs for three consecutive times (Err22 is reported for three consecutive times).	◆ 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
Err53	Door lock fault	◆ 101: Multiple door lock feedback signals remain active for more than 3s during door open. ◆ 102: The state of multiple door lock feedback signals is inconsistent for more than 2s.	◆ 101: Check whether the door lock circuit is normal, whether the feedback contact of the door lock contactor acts properly, and whether the system receives the door open limit signal when the door lock signal is valid. ◆ 102: Check whether the state of the hall door lock and the car door lock is inconsistent when the hall door lock signal and the car door lock signal are detected separately.	5A
Err54	Startup overcurrent during inspection	◆ The startup current during inspection exceeds 110% of the rated current.	◆ Reduce the load. ◆ Change Bit1 of FC-00 to 1 to cancel the startup current detection function.	5A

Fault Code	Fault Description	Possible Cause	Solution	Level
Err55	Stop at another floor	◆ 101: During automatic running of the elevator, the door open limit is not achieved at the present floor.	◆ 101: Check the door open limit signal on the present floor.	1A
Err57	SPI communication fault	◆ 101, 102: The SPI communication is abnormal. No correct data is received with 2s of DSP communication. ◆ 103: The MCB does not match the bottom drive board.	◆ 101, 102: Check the wiring between the MCB and the drive board. ◆ 103: Contact the agent or Inovance.	5A
Err58	Shaft position switch abnormal	◆ 101: The up slow-down switch and down slow-down switch are disconnected simultaneously. ◆ 102: The up limit switch and down limit switch are disconnected simultaneously.	◆ 101, 102: Check whether the states (NO, NC) of the slow-down switches and limit switches are consistent with the parameter setting (NO, NC) of the MCB. ◆ Check whether mal-function of the slow-down switches and limit switches occurs.	4B
Err62	Analog input cable broken	◆ The analog input cable of the CTB or the MCB is broken.	◆ Check whether F8-08 is set correctly. ◆ Check whether the analog input cable of the CTB or MCB is connected incorrectly or broken.	1A
Err63	Shaft type signal input abnormal	◆ The selection of the shaft type is inconsistent with the deceleration signal input.	◆ Check whether the function of the deceleration signal input is set correctly.	4A



NOTE

◆ The number (such as 1, 3...101, 102, 103...) in the table indicates the fault subcode.
◆ Fault Err41 is not recorded when the elevator is in stop state.
◆ Fault Err42 is reset automatically when the door lock circuit is connected or 1s after the fault occurs in the door zone.
◆ If fault Err57 persists, it is recorded once per hour.

7 Maintenance

7.1 Maintenance and Inspection

7.1.1 Routine Maintenance

The influence of the ambient temperature, humidity, dust, and vibration will cause the aging of the components inside the controller, thereby leading to potential faults or reduced service life of the controller. Therefore, it is necessary to carry out routine and periodic maintenance.

1) Daily inspection:

- Whether abnormal noise exists during motor running;
- Whether the motor vibrates excessively;
- Whether the installation environment of the controller changes;
- Whether the cooling fan of the controller works properly;
- Whether the controller overheats.

2) Daily cleaning:

- Keep the controller clean all the time.
- Remove the dust on the surface of the controller, especially metal powders, to prevent the dust from entering the controller;
- Clear the oil stain on the cooling fan of the controller.

7.1.2 Periodic Checks

Regularly check the components that can hardly be check during running.

Periodic check items:

- Check and clean the air filter periodically.
- Check whether the screws become loose.
- Check whether the controller is corroded.
- Check whether the wiring terminals have arc signs;
- Carry out the main circuit insulation test.

NOTE

◆ Before measuring the insulating resistance with megger (500 VDC megger recommended), disconnect the main circuit from the controller. Do not use the megger to test the insulation of the control circuit. The high voltage test need not be performed again because it has been completed before delivery.

7.1.3 Replacement of Quick-wear Parts

Quick-wear parts of the controller include the cooling fan and filter electrolytic capacitor. Their service life is closely related to the operating environment and maintenance. The service life of the two components is listed in the following table.

Component	Service Life
Cooling fan	2 to 3 years
Electrolytic capacitor	4 to 5 years

- Ambient temperature: average 30°C per year
- Load rate: below 80%
- Running time: less than 20 h per day

1) Cooling fan

- Possible damage causes: bearing worn or blade aging;
- Judging criteria:

  (a) Whether there is crack on the blade;

  (b) Whether there is abnormal vibration noise at startup.

2) Filter electrolytic capacitors

- Possible damage causes: input power supply in poor quality, high ambient temperature, frequent load jumping or electrolytic aging;
- Judging criteria:

  (a) Whether there is liquid leakage;

  (b) Whether the safety valve has projected;

  (c) The value of the static capacitance;

  (d) The value of the insulation resistance.

7.2 Storage of the Controller

After purchasing the controller, pay attention to the following aspects for temporary and long-term storage:

- Pack the controller with the original packing box provided by Inovance;
- Long-term storage degrades the electrolytic capacitor. Thus, the controller must be energized once every two years, with each time lasting at least five hours. The input voltage must be increased slowly to the rated value with the regulator.

Appendix A Electromagnetic Compatibility

A.1 European Conformity

Figure A-1 CE mark

1) The CE mark indicates compliance with European safety and environmental regulations. The European Norm includes the Machinery Directive for machinery manufacturers, the LVD for electronics manufacturers, and EMC Directive for electromagnetic interference control.

2) The CE mark is required for engaging in commercial business (production, importation, and distribution) in Europe.

3) This controller carries the CE mark and complies with the following directives:

- LVD: 2014/35/EU
- EMC Directive: 2014/30/EU

4) Machines and devices integrating this controller must also be CE certified and marked.

5) The integrator who integrates this controller into other products and attaches CE mark to the final assembly has the responsibility of ensuring compliance with CE standards and the European Norm.

A.2 EMC Directive Compliance

EMC describes the ability of devices or systems to work normally in the electromagnetic environment and not to generate electromagnetic interference that influences other local devices or systems. In other words, EMC includes two aspects: 1) The electromagnetic interference generated by a device or system during normal running must be within a certain limit; 2) Each device or system must have sufficient immunity to the electromagnetic interference in the environment in which it is meant to function.

The controller is compliant with directives EN12015:2014 and EN12016:2013 for EMC if following requirements are met.

1) Install an EMC filter on the controller's input side and the shielded cable on the output side, and ensure that the filter is reliably grounded and the output cable is grounded 360 degrees with a cable gland. For the selection of EMC filter, see section *"A.2.1 Installation of EMC Input Filter on Power Input Side" on page 129*.

2) Install an AC input reactor on the input side to eliminate the harmonics of the input current. For details, see section *"A.2.2 Installation of AC Input Reactor on Power Input*

Side" on page 129.

3) Use a shielded drive cable between the controller and the motor. For the selection and installation of the cable, see section "A.3.1 Requirements on Shielded Cables" on page 130.

4) Install and wire the controller according to the recommended wiring method. For details, see section "A.3.2 Requirements on Motor Wiring" on page 131.

A.2.1 Installation of EMC Input Filter on Power Input Side

An external EMC filter installed between the controller and the power supply not only suppresses the interference of electromagnetic noise in the surrounding environment on the controller but also prevents the interference from the controller on surrounding devices. The installation precautions are as follows:

- Strictly comply with the ratings when using the EMC filter. The metal housing ground of the filter should be in good contact with the metal ground of the installation cabinet on a large area, and a good conductive continuity is required. Otherwise, it will result in electric shock or poor EMC effect.
- The ground of the EMC filter and the PE conductor of the controller must be connected to the same common ground. Otherwise, the EMC effect will be affected seriously.
- The EMC filter must be installed as closely as possible to the power input side of the controller. The cable between the filter and the controller must be as short as possible (within 30 cm).

The following table lists the recommended manufacturers and models of the EMC filter for the controller. Select a proper one based on actual requirements.

Table A-1 Recommended manufacturers and models of the EMC input filter

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	Filter Model (Manufacturer: Changzhou Jianli)	Filter Model (Manufacturer: SCHAFFNER)
Three-phase 380 V, range: -15% to 15%				
NICE-L-I-4003	5.9	10.5	DL-16EBK5	FN 3258-7-44
NICE-L-I-4005	8.9	14.8	DL-16EBK5	FN 3258-16-33
NICE-L-I-4007	11.0	20.5	DL-25EBK5	FN 3258-30-33
NICE-L-I-4011	17.0	29.0	DL-35EBK5	FN 3258-30-33
NICE-L-I-4015	21.0	36.0	DL-50EBK5	FN 3258-42-33

A.2.2 Installation of AC Input Reactor on Power Input Side

The AC input reactor is an option used to suppress the harmonics of the input current. In applications where strong suppression of harmonics is required, install an external AC input reactor. The following table lists the recommended manufacturer and models

of the AC input reactor.

Table A-2 Recommended manufacturer and models of the AC input reactor

Controller Model	Power Capacity (kVA)	Rated Input Current (A)	AC Input Reactor Model (Manufacturer: Inovance)
Three-phase 380 V, range: -15% to 15%			
NICE-L-I-4003	5.9	10.5	MD-ACL-10-1.4 -4T-2%
NICE-L-I-4005	8.9	14.8	MD-ACL-15-0.93-4T-2%
NICE-L-I-4007	11.0	20.5	MD-ACL-30-0.47-4T-2%
NICE-L-I-4011	17.0	29.0	MD-ACL-30-0.47-4T-2%
NICE-L-I-4015	21.0	36.0	MD-ACL-40-0.35-4T-2%

A.3 Requirements on Shielded Cables and Wiring

A.3.1 Requirements on Shielded Cables

To fulfill the EMC requirements, use the shielded cables. Shielded cables are classified into three-conductor cables and four-conductor cables. Four-conductor shielded cables are recommended, of which one phase conductor is PE cable. When a three-conductor cable is used, add a separate PE cable if the conductivity of the cable shield cannot meet the requirement, as shown in the following figure.

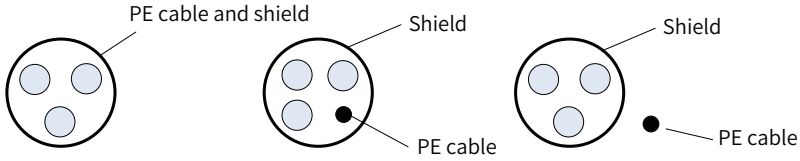


Figure A-2 Cross section of recommended shielded cables

The cable shield, which serves to suppress the emission and conduction of the radio frequency interference, must be made of co-axial copper braids with a weaving density larger than 90% to enhance shielding effectiveness and conductivity performance. See the following figure.

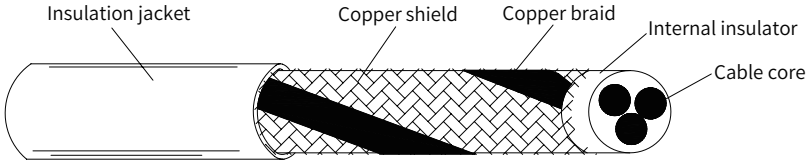


Figure A-3 Weaving density of the cable shield

It is recommended that all control cables and power cables be shielded. The grounding area of the shielded cable should be as large as possible. Fix the shield on the sheet metal using the metal cable clamp to achieve good contact, as shown in the following figure.

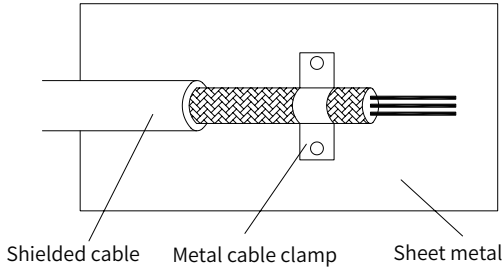


Figure A-4 Shield fixed by the metal cable clamp

Use shielded cables as motor cables. The following figure shows the grounding method of shielded cables.

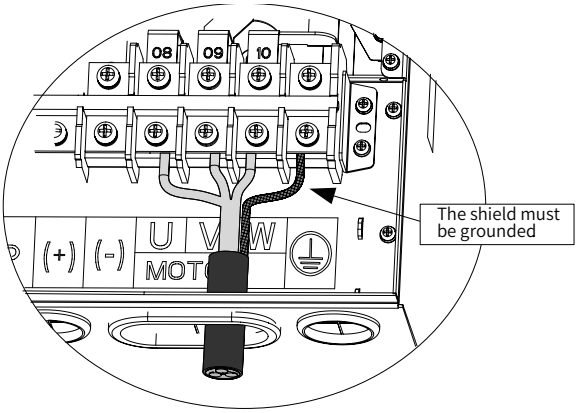


Figure A-5 Grounding of shielded cables

A.3.2 Requirements on Motor Wiring

The motor cables must be laid away from other cables. The recommended distance is larger than 0.5 m. The motor cables of several controllers can be laid in parallel.

It is recommended that the motor cables be protected in the sheathing with metal shield or cabling duct with metal plate. Both sides of the sheathing and cabling duct must be grounded reliably.

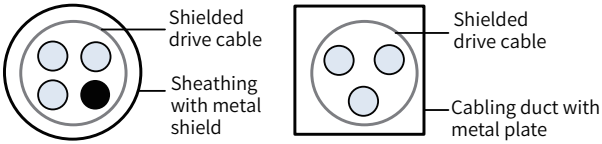


Figure A-6 Requirements on motor wiring

The motor cables and other cables cannot be laid in parallel for a long distance to prevent the electromagnetic interference caused by the rapid change of the controller's output voltage. It is recommended that the motor cables, power input cables, and control cables be laid in different cable trays. Cable trays must be in good connection and well grounded.

If the control cable must run across the power cable, make sure the angle between them is close to 90 degrees. Other cables cannot run across the controller.

Power input and output cables and weak-current signal cables (such as control cables) of the controller must, if possible, be laid vertically rather than in parallel.

Cable trays must be in good connection and well grounded. Aluminum cable trays can be used to improve equal potential.

The filters and the controller must be properly connected to the control cabinet, with spraying protection applied at the installation part and the conductive metal kept in full contact.

The motor must be properly connected to systems (machines or devices), with spraying protection applied at the installation part and the conductive metal kept in full contact.

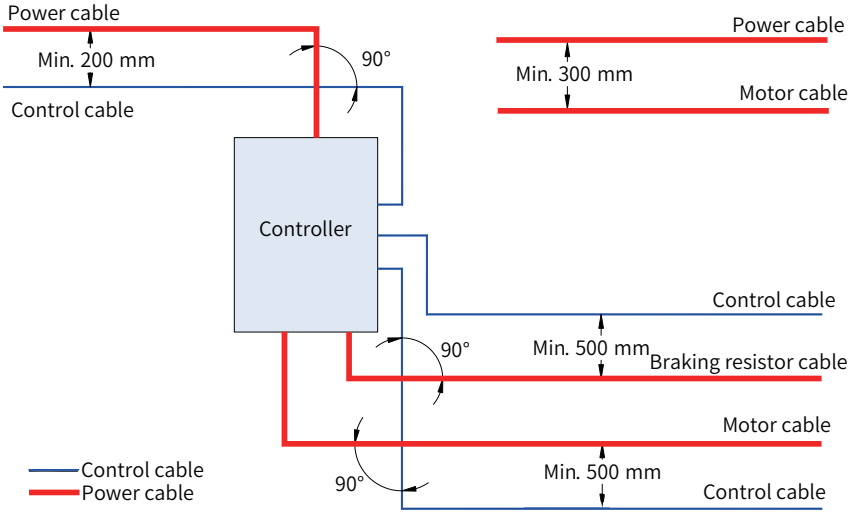


Figure A-7 Requirements on system wiring

A.4 Solutions to Common EMC Interference Problems

The controller generates strong interference. Although EMC measures are taken, interference may still exist due to improper wiring or grounding during use. When the controller interferes with other devices, adopt the following solutions.

Interference Type	Solution
Earth leakage circuit breaker (ELCB) tripping	◆ Connect the motor housing to the PE terminal of the controller. ◆ Connect the PE terminal of the controller to the PE terminal of the mains power supply. ◆ For tripping at the moment of power-on, cut off the large capacitor to ground on the power input side by disconnecting the grounding terminal of the external filter and disconnecting the grounding terminal of Y capacitor to ground of the input ports. ◆ For tripping during running or when the controller is enabled, take leakage current suppression measures on the input side (install a filter, install a safety capacitor + wind a ferrite core, or wind a ferrite core).
Interference generated during running	◆ Connect the motor housing to the PE terminal of the controller. ◆ Connect the PE terminal of the controller to the PE terminal of the mains power supply. ◆ Install a filter or safety capacitance box and wind a ferrite core for the power input cables. ◆ Add a capacitor or ferrite core to the interfered signal port. ◆ Apply a common-ground connection between devices.
Communication interference	◆ Connect the motor housing to the PE terminal of the controller. ◆ Connect the PE terminal of the controller to the PE terminal of the mains power supply. ◆ Install a filter or safety capacitance box and wind a ferrite core for the power input cables. ◆ Add a termination resistor between the communication cable source and the load. ◆ Add an auxiliary reference ground wire if the differential cable pair is used for external communication. ◆ Adopt shielded communication cables, and connect the cable shield to the common ground of communication. ◆ Adopt daisy chain wiring mode for multi-node communication, with branch length less than 30 cm.
I/O interference	◆ Enlarge the capacitance filter of low-speed DI terminals. The recommended maximum value is 0.1 μF. ◆ Enlarge the capacitance filter of AI terminals. The recommended maximum value is 0.22 μF.

A.5 Installation of Safety Capacitance Box and Ferrite Core

To filter out part of the interference generated during running, connect a safety capacitance box and wind a ferrite core or wind a ferrite core individually (not including PE cable) around the input/output cable in some applications. The safety capacitance box must be grounded to the grounding terminal of the controller with a grounding cable as short as possible (within 30 cm).

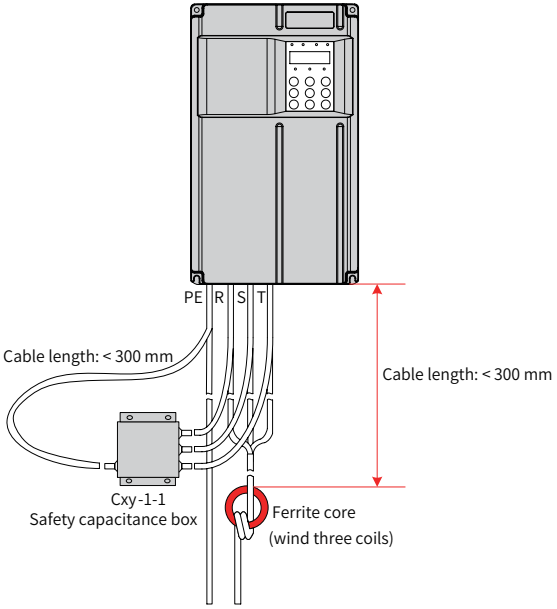


Figure A-8 Installation of the safety capacitance box and the ferrite core

Table A-3 Models of the ferrite core

Model	Product Code	Dimension (Outer Diameter x Inner Diameter x Thickness) (mm)
DY644020H	11013031	64 x 40 x 20
DY805020H	11013032	80 x 50 x 20
DY1207030H	11013033	120 x 70 x 30

Table A-4 Model and dimensions of the safety capacitance box

Model	Product Code	Dimension (Width x Depth x Height) (mm)	Mounting Dimension (Width x Depth) (mm)
Cxy-1-1	11025018	85 x 72 x 38	45 x 75

Revision History

Date	Revision	Change Description
July 2017	A00	First issue.
May 2019	A01	1. Added the models of the controller. 2. Updated parameters. 3. Updated Appendix A.

INOVANCE Warranty Agreement

1) Inovance provides an 18-month free warranty to the equipment itself from the date of manufacturing for the failure or damage under normal use conditions.
2) Within the warranty period, maintenance will be charged for the damage caused by the following reasons:
   a. Improper use or repair/modification without prior permission
   b. Fire, flood, abnormal voltage, natural disasters and secondary disasters
   c. Hardware damage caused by dropping or transportation after procurement
   d. Operations not following the user instructions
   e. Damage out of the equipment (for example, external device factors)
3) The maintenance fee is charged according to the latest Maintenance Price List of Inovance.
4) If there is any problem during the service, contact Inovance's agent or Inovance directly.
5) Inovance reserves the rights for explanation of this agreement.

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